Vol. 1070 Number 2

# OFFICIAL GAZETTE

## of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

September 9, 1986

U.S.
DEPARTMENT
OF COMMERCE

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# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 9, 1986 Volume 1070 Number 2


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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

| | |
|---|---|
| Transmittal fee: | 170.00 |
| Search Fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| —No corresponding prior U.S. national application filed | 420.00 |
| —Corresponding prior U.S. national application filed | 250.00 |
| European Patent Office as Searching Authority | |
| if paid before June 1, 1986 | 830.00 |
| if paid on or after June 1, 1986 | 930.00 |
| International fees | |
| Basic fee (first 30 pages): | |
| if paid before June 1, 1986 | 325.00 |
| if paid on or after June 1, 1986 | 375.00 |
| Basic Supplemental fee (for each page over 30): | |
| if paid before June 1, 1986 | 6.00 |
| if paid on or after June 1, 1986 | 7.00 |
| Designation fee for the first 10 national or regional offices: | |
| if paid before June 1, 1986 | 80.00 |
| if paid on or after June 1, 1986 | 90.00 |
| Designation fee for 11th and subsequent designations | No charge |

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

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### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Sept. 6, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,402,091 through 4,403,352
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED JUNE 22, 1986, DUE TO FAILURE TO PAY MAINTEANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,335,515 | 06/221,027 | 6/22/82 |
| 4,335,522 | 06/237,608 | 6/22/82 |
| 4,335,535 | 06/267,610 | 6/22/82 |
| 4,335,572 | 06/258,203 | 6/22/82 |
| 4,335,644 | 06/261,090 | 6/22/82 |
| 4,335,679 | 06/260,098 | 6/22/82 |
| 4,335,682 | 06/247,313 | 6/22/82 |
| 4,335,700 | 06/234,918 | 6/22/82 |
| 4,335,703 | 06/217,226 | 6/22/82 |
| 4,335,732 | 06/228,573 | 6/22/82 |
| 4,335,737 | 06/216,770 | 6/22/82 |
| 4,335,791 | 06/251,208 | 6/22/82 |
| 4,335,866 | 06/277,309 | 6/22/82 |
| 4,335,895 | 06/240,093 | 6/22/82 |
| 4,335,966 | 06/218,202 | 6/22/82 |
| 4,335,978 | 06/251,820 | 6/22/82 |
| 4,336,047 | 06/222,113 | 6/22/82 |
| 4,336,051 | 06/219,582 | 6/22/82 |
| 4,336,087 | 06/248,864 | 6/22/82 |
| 4,336,098 | 06/250,951 | 6/22/82 |
| 4,336,108 | 06/218,203 | 6/22/82 |
| 4,336,114 | 06/247,577 | 6/22/82 |
| 4,336,202 | 06/264,463 | 6/22/82 |
| 4,336,221 | 06/219,431 | 6/22/82 |
| 4,336,241 | 06/244,844 | 6/22/82 |
| 4,336,284 | 06/216,256 | 6/22/82 |
| 4,336,443 | 06/227,284 | 6/22/82 |
| 4,336,537 | 06/217,270 | 6/22/82 |

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

**4,439,962,** Re. S.N. 846,710, Filed Apr. 1, 1986, Cl. 52/200, SKYLIGHT CONSTRUCTION, Arthur P. Jentoft, et al., Owner of Record: *Wasco Products, Inc., Sanford, Me.,* Attorney or Agent: David M. Driscoll, et al., Ex. Gp.: 354

**4,454,077,** Re. S.N. 873,197, Filed June 10, 1986, Cl. 261/91, PROCESS AND APPARATUS FOR MIXING A GAS AND A LIQUID, Lawrence M. Litz, Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 135

**4,454,953,** Re. S.N. 829,798, Filed Feb. 14, 1986, Cl. 213/166, TELESCOPING UNCOUPLING LEVER, Osvalds F. Chierici, Owner of Record: *Inventor,* Attorney or Agent: Gerard J. Weiser, et al., Ex. Gp.: 312

**4,457,975,** Re. S.N. 880,817, Filed July 1, 1986, Cl. 428/154, TREE RESISTANT POWER CABLE, George Bahder, Owner of Record: *Cable Technology Laboratories, Inc., New Brunswick, N.J.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 154

**4,459,336,** Re. S.N. 880,431, Filed June 6, 1986, Cl. 346/208, HEAT-SENSITIVE COLOR-FORMING RECORDING MATERIAL AND PROCESS FOR PREPARATION THEREOF, Nobuhiro Miyakawa, Owner of Record: *Mita Industrial Co., Ltd., Osaka, Japan,* Attorney or Agent: Leonard W. Sherman, Ex. Gp.: 154

**4,460,919,** Re. S.N. 878,631, Filed June 26, 1986, Cl. 358/44, SOLID-STATE COLOR TELEVISION CAMERA DEVICE, Yasuo Takemura, Owner of Record: *Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan,* Attorney or Agent: Donald W. Banner, Ex. Gp.: 262

**4,512,341,** Re. S.N. 876,777, Filed June 20, 1986, Cl. 335/128, NEBULIZER WITH CAPILLARY FEED, Victor E. Lester, Owner of Record: *Inventor,* Attorney or Agent: Robert B. Chickering, et al., Ex. Gp.: 335

**4,547,102,** Re. S.N. 879,195, Filed June 26, 1986, Cl. 408/185, REAMER WITH ANGLED BLADE AND FULL LENGTH CLAMP, Douglas Millington, et al., Owner of Record: *Cogsdill Tool Products, Inc., Camden, S.C.,* Attorney or Agent: Jeffrey A. Sadowski, Ex. Gp.: 322

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**Re. 31,848,** Reexam. No. 90/001,051, Requested: July 3, 1986, Cl. 315/360, ELECTRONIC ASSEMBLY, Ole K. Nilssen, Owner of Record: *Ole K. Nilssen, Barrington, Ill.,* Attorney or Agent: Ole K. Nilssen, Ex. Gp.: 260, Requester: Intermatic, Inc., Spring Grove, Ill.

**3,523,889,** Reexam. No. 90/001,061, Requested: July 29, 1986, Cl. 210/713, METHOD AND APPARATUS FOR SEPARATING LIQUIDS FROM SOLIDS, Frederick G. Eis, Owner of Record: *American Sugar Co., New York, N.Y.,* Attorney or Agent: Flehr, Hohbach, et al., Ex. Gp.: 130, Requester: Trask, Britt, & Rossa, Salt Lake City, Utah

**3,540,070,** Reexam. No. 90/001,053, Requested: July 11, 1986, Cl. 15/83, PIVOTABLE SECTION FOR BOTTOM OF HOPPER ON SWEEPING MACHINE, Neil F. Brown, Owner of Record: *G. H. Tennant Co., Minneapolis, Minn.,* Attorney or Agent: Alfred H. Plyer, Jr., Ex. Gp.: 240, Requester: Owner

**3,713,099,** Reexam. No. 90/001,049, Requested: July 2, 1986, Cl. 382/34, METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS AND THE LIKE, Harold Hemstreet, Owner of Record: *Harold Hemstreet, Wilton, Conn.,* Attorney or Agent: None, Ex. Gp.: 260, Requester: Burroughs Corp., Detroit, Mich.

**3,713,100,** Reexam. No. 90/001,050, Requested: July 2, 1986, Cl. 382/34, METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS AND THE LIKE, Harold Hemstreet, Owner of Record: *Harold Hemstreet, Wilton, Conn.,* Attorney or Agent: None, Ex. Gp.: 260, Requester: Burroughs Corp., Detroit, Mich.

**3,808,925,** Reexam. No. 90/001,063, Requested: Aug. 4, 1986, Cl. 83/346, ROTARY VENEER CLIPPER, John E. Hards, Owner of Record: *Durand-Boute Ind., Ltd., New Westminster, Canada,* Attorney or Agent: Fetherstonhaugh & Co., Ex. Gp.: 320, Requester: Angelo Cremona & Figlio S.P.A., Milan, Italy

**3,834,052,** Reexam. No. 90/001,044, Requested: June 27, 1986, Cl. 42/18, MOUNT FOR GUNSIGHT, William F. Steck, Owner of Record: *Omark Industries, Inc., Portland, Oreg.,* Attorney or Agent: None, Ex. Gp.: 220, Requester: Daniel Bechtel, Fort Worth, Tex.

**3,842,235,** Reexam. No. 90/001,056, Requested: July 15, 1986, Cl. 219/83, METHOD OF ELECTRIC SEAM RESISTANCE WELDING, Paul Opprecht, Owner of Record: *Elpatronic AG, Zug, Switzerland,* Attorney or Agent: Browdy & Neimark, Ex. Gp.: 210, Requester: Soudronic Ltd., New York, N.Y.

**3,845,351,** Reexam. No. 90/001,046, Requested: July 1, 1986, Cl. 315/293, METHOD AND APPARATUS FOR THE ADJUSTMENT OF A PLURALITY OF FLOODLIGHTS, Fritz von Ballmoos, Owner of Record: *Paul Weller, New York, N.Y.,* Attorney or Agent: Werner Kleeman, Ex. Gp.: 260, Requester: Vari-Lite, Inc., Dallas, Tex.

**3,910,296,** Reexam. No. 90/001,047, Requested: June 27, 1986, Cl. 134/2, METHOD OF REMOVING PROTEINACEOUS DEPOSITS FROM CONTACT LENSES, Hampar L. Karageozian, Owner of Record: *Allergan Caribbean, Irvine, Calif.,* Attorney or Agent: Arnold White & Durkee, Ex. Gp.: 130, Requester: Owner

**4,021,891,** Reexam. No. 90/001,055, Requested: July 22, 1986, Cl. 24/303, MAGNETIC LOCK CLOSURE, Tamao Morita, Owner of Record: *Application Art Laboratories Co., Tokyo, Japan,* Attorney or Agent: Wendroth, Lind, et al., Ex. Gp.: 350, Requester: Owner

**4,157,728,** Reexam. No. 90/001,052, Requested: July 10, 1986, Cl. 164/004, PROCESS FOR DIRECT CHILL CASTING OF METALS, Ryota Mitamura, Owner of Record: *Showa Aluminum Industries, K.K., Tokyo, Japan,* Attorney or Agent: Armstrong, Nikaido, et al., Ex. Gp.: 320, Requester: Christopher Duffy, Seattle, Wash.

**4,322,335,** Reexam. No. 90/001,064, Requested: Aug. 4, 1986, Cl. 523/522, FAST CRYSTALLIZING BLOCK COPOLYESTER COMPOSITION, Eric Nield, Owner of Record: *Imperial Chemical Ind., Ltd., London, England,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 150, Requester: Leonard Bloom, Towson, Md.

**4,344,530,** Reexam. No. 90/001,057, Requested: July 16, 1986, Cl. 206/203, CASE FOR BEVERAGE BOTTLES, Pierre J. deLarosiere, Owner of Record: *International Container Systems, Inc., Tampa, Fla.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 240, Requester: Owner

**4,344,530,** Reexam. No. 90/001,060, Requested: July 28, 1986, Cl. 206/213, CASE FOR BEVERAGE BOTTLES, Pierre J. deLarosiere, Owner of Record: *International Container Systems, Inc., Tampa, Fla.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 240, Requester: Rehrig-Pacific Co., Inc., Los Angeles, Calif.

**4,407,067,** Reexam. No. 90/001,048, Requested: July 2, 1986, Cl. 30/50, SHAVING IMPLEMENT, Robert A. Trotta, Owner of Record: *The Gillette Co., Boston, Mass.,* Attorney or Agent: Scott R. Foster, Ex. Gp.: 320, Requester: Leydig, Voit, et al., Chicago, Ill.

**4,408,054,** Reexam. No. 90/001,062, Requested: Aug. 1, 1986, Cl. 546/226, OXIMES OF 4-BENZOYL-PIPERIDINES, Joseph T. Strupczewski, et al., Owner of Record: *Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.,* Attorney or Agent: Raymond R. Wittekind, Ex. Gp.: 120, Requester: Owner

**4,457,544,** Reexam. No. 90/001,054, Requested: July 17, 1986, Cl. 285/251, CONNECTOR FOR FLEXIBLE ELECTRICAL CONDUIT, Thomas M. Snow, et al., Owner of Record: *Liquid Tight Corp., Bensenville, Ill.,* Attorney or Agent: Nate F. Scarpelli, Ex. Gp.: 350, Requester: Owner

**4,484,459,** Reexam. No. 90/001,058, Requested: July 22, 1986, Cl. 66/84, BIASED MULTI-LAYER STRUCTURAL FABRIC COMPOSITES STITCHED IN A VERTICAL DIRECTION AND PROCESS AND APPARATUS FOR MAKING SAME, Harold K. Hutson, Owner of Record: *Knytex, Inc., Minneapolis, Minn.,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 240, Requester: Owner

**4,550,045,** Reexam. No. 90/001,059, Requested: July 22, 1986, Cl. 428/102, BIASED MULTI-LAYER STRUCTURAL FABRIC COMPOSITES STITCHED IN A VERTICAL DIRECTION, Harold K. Hutson, Owner of Record: *Knytex, Inc., Minneapolis, Minn.,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 150, Requester: Owner

**4,556,122,** Reexam. No. 90/001,045, Requested: June 30, 1986, Cl. 181/135, EAR ACOUSTICAL HEARING AID, Richard L. Goode, Owner of Record: *Innovative Hearing Corp., San Jose, Calif.,* Attorney or Agent: Flehr, Hohbach, et al., Ex. Gp.: 210, Requester: Owner

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**Errata**

The following registration number was inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of Aug. 2, 1983.

| | | |
|---|---|---|
| 1,034,389 | TM 142 | Aug. 2, 1983 |

Consequently, the above-identified registration is still active.

Aug. 5, 1986.

PATRICIA M. DAVIS,
*Administrator for*
*Trademark Operations.*

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**Use of Color Drawings in Utility Patents**

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be necessary under 35 U.S.C. 112. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of§1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes. In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the Letters Patent and the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, copies of the patent with color drawings will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary under 37 CFR 1.21(k) to recover the actual costs associated therewith.

Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color to meet the requirements of 35 U.S.C. 112. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

Such a petition will be granted only when color drawings are determined to be necessary under 35 U.S.C. 112. The petition should be directed to the Office of the Deputy Assistant Commissioner for Patents.

RENE D. TEGTMEYER,
Aug. 6, 1986. *Assistant Commissioner for Patents.*

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**Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371**

The purpose of this notice is to set forth procedural guidelines for deciding questions of unity of invention which may arise in international applications when searched by the United States Patent and Trademark Office (USPTO) as an International Searching Authority and when examined during the national phase in the United States as a Designated Office after entry under 35 U.S.C. 371 in connection with the Patent Cooperation Treaty (PCT).

The May 28, 1986, decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, Civil Action No. 84–1212–A, (E.D. Va.) held the Patent and Trademark office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing legislation. In the Caterpillar international application, the USPTO, when acting as an International Searching Authority, held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging such a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically designed" as found in PCT Rule 13.2(ii) means that the process and apparatus can only be used with each other as set forth in the Manual of Patent Examining Procedure (MPEP) §806.05(e).

Therefore, in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 as interpreted in *Caterpillar* will be followed when considering unity of invention of claims of different categories without regard to 37 CFR 1.141. No change is being made in the restriction practice under 37 CFR 1.141(b) and (c) in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT or U.S. national applications. Such a change in U.S. national restriction practices would require a statutory change in the fee levels to cover the additional examining effort required in individual patent applications.

PCT Rules 13.1 and 13.2 are reproduced below:

PCT RULE 13
Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

PCT Rule 13 only will be applied in the restriction practice used in national phase applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations".

*Guidelines As to Implementation of Revised Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371*

(1) The revised practice for international and national phase applications will *not* be used for national applications filed under 35 U.S.C. 111.

(2) The revised practice will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues. Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations are *not* affected for any applications by this notice.

(3) The expression "and as set forth in §§1.141" in 37 CFR 1.481(a) will no longer be considered operative in view of the decision in *Caterpillar Tractor Co.*, supra. The criteria of §1.141 continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 as they were in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, practice will continue as set forth in MPEP Chapter 800 as modified in 1046 OG 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be required where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.

(4) The criteria of PCT Rule 13 will be applied when determining unity of invention of claims to different categories of invention in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371.

(5) The revised practice will apply to all international applications before the PTO as an International Searching Authority in which no search report has been issued

and in all pending national stage applications entered under 35 U.S.C. 371 in which a holding of lack of unity of invention (requirement for restriction) has not been made final by the examiner or acquiesced in by the applicant as of the date of this notice.

(6) In applying PCT Rule 13 to international applications as an International Searching Authority and to national phase applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, of claims to the categories which meet the requirements of any one of PCT Rule 13.1(i) to (iii).

In view of the court's treatment of the USPTO's distinctness test in Caterpillar, the USPTO will also permit in the same international application the following two combinations:

(a) an independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.

(b) an independent claim for a given product and an independent claim for a process of using the said product.

If the different categories of claims do not fall within any *one* of PCT Rule 13.2(i) to (iii) or additional combinations (a) or (b) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (a) or (b) above, unity of invention may not be present. Further, an independent claim for a use in PCT Rule 13.2(i) and combination (b) above is construed as being limited to a claim directed to a process.

In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (a) above, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

*Detailed Explanation*

Under PCT Rule 13.2, Unity of Invention as to different categories of inventions is covered on the basis of 4 different categories of invention. They are:

A. a product
B. a process (for manufacture)
C. a use of the said product
D. an apparatus or means for carrying out the process for manufacture.

PCT Rule 13.2 provides for grouping of certain of these different categories of inventions and retaining unity of invention.

i. PCT Rule 13.2(i) provides for grouping claims to:

A. a product
B. a process for the manufacture of said product
C. a use of the said product

ii. PCT Rule 13.2(ii) provides for grouping claims to:

B. a process (e.g. for the manufacture of a product)
D. an apparatus or means for carrying out the said process.

iii. PCT Rule 13.2(iii) provides for grouping claims to:

A. a product
B. a process for the manufacture of the product
D. apparatus or means for carrying out the process.

Also permitted by the USPTO are combinations:

(a) A. a product
B. a process for the manufacture of said product

(b) A. a product
C. a use of the said product

If an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (a) or (b) above, and no additional categories of invention are present, unity of invention exists and no additional search fees should be required or restriction requirement made.

For example, if an application contains claims to only a process for the manufacture of a product and claims to a use of a product and no product claims is present, there is lack of unity of invention since the provisions of Rule 13.2(i) do not apply and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also, if claims to all three categories of PCT Rule 13.2(i) are present at the time of the first Office action and all the product claims are canceled in the response to the first Office action, a requirement for restriction could be made, if appropriate, in the second Office action in view of the independent inventions remaining in the application. PCT Rule 13.2(i) would no longer apply since all three categories of claims would no longer be present in the application. However, the fact that claims to a certain category of invention are unpatentable does not affect the question of unity of invention provided the unpatentable claims are retained in the application.

Where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above included in an application, unity of invention may be lacking between the claims drawn to the categories set forth in any *one* of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above, and the claims to the additional category of invention. For example, if an application contained claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a use of the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product could be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention so that more than one paragraph of PCT Rule 13.2 and combinations (a) or (b) above applies, the examiner will inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (iii) and (ii), and then combinations (a) or (b) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in accordance with theprovisions of Chapter 800 of the MPEP.

Under PCT Rule 13.2 and combinations (a) and (b) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing and one use. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims will be considered as the elected invention. The first recited invention of each additional category which is related as described in paragraph 7 below wit. the first invention as indicated in the previous sentence will be considered elected. Accordingly,

for example, if multiple products are claimed, the first recited product is constructively elected and the first recited process, if multiple processes adapted for making and/or using the product are claimed, is also constructively elected. Any such holding by the examiner will be made in the form of a restriction requirement in an application entered in the USPTO under 35 U.S.C. 371. Such a restriction requirement would be made on the basis of criteria set forth in MPEP Chapter 800. Applicant would have the right to traverse such a restriction requirement in the response to the Office action.

(7) The inventions recited by the claims of different categories must be drawn to related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (a) and (b) above must be able to be made by the claimed process for manufacture and the use claimed must be able to use the claimed product. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be able to carry out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be able to make the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(8) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

(9) Any prior notices or policies relating to unity of invention which are inconsistent herewith are superceded to the extent they are inconsistent with this notice.

Appropriate changes in the Code of Federal Regulations will be proposed in due course to adjust the level of the search fees and national fees of §1.445 to recover the cost of searching and examining international applications with claims to different categories of invention in a single international application. The fees were originally set based on the unity of invention practice previously in effect.

If necessary, additional guidance for processing applications under PCT Rule 13 will be issued as experience is gained.

DONALD J. QUIGG,
Aug. 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

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**Patents Available for License or Sale**

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers..

Applications for licenses may be addressed to: Patent Counsel, Aerospace Control Systems Dept., General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902

4,591,844. LINE SMOOTHING FOR A RASTER DISPLAY.
D. 281,502. VIDEOCONFERENCING CONSOLE WITH MULTIPLE VIDEO TRANSMITTING AND RECEIVING DEVICES.

4,231.061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Samuel Freeman,* 13 Birchwood Ct. East, Syosset, N.Y. 11791.
4,367,586. DUSTLESS CUTTER. *Edwin E. Greigg, Esq.,* 1201 S. Eads St., Suite 100, Arlington, Va. 22202.
4,571,195. RECREATIONAL APPARATUS. *J. Stewart Brams, Jr.,* Carothers and Carothers, 1900 Commonwealth Bldg., Pittsburgh, Pa. 15222.
4,588,863. SYSTEM FOR FACILITATING PROFESSIONAL TELEPHONE COMMUNICATION. *James M. Ress,* 5300 27th St., North Arlington, Va. 22207.
06/690/888. ROTARY INTERNAL COMBUSTION ENGINE. *Joseph F. Frasca,* 5801 Yorktown Rd., Lorain, Ohio 44053.

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**Department of the Treasury**
**U.S. Customs Service**
**(T.D. 86–150)**
**Recordation of Trade Name:**
**"CHRISTIAN KIM, INC."**

**Agency:** U.S. Customs Service, Department of the Treasury
**Action:** Notice of Recordation
**Summary:** On Apr. 28, 1986, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CHRISTIAN KIM, INC." was published in the Federal Register (51 FR 15857). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than June 27, 1986. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "CHRISTIAN KIM, INC." is recorded as the trade name used by Christian Kim, Inc., a corporation organized under the laws of the State of Calif., located at 124 E. Olympic Blvd., Los Angeles, Calif. 90015. The trade name is used in connection with footwear, manufactured in Korea.
**Dated:** Aug. 7, 1986
**For Further Information Contact:** Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., N.W., Washington, D.C. 20229 (202–566–5765).

EDWARD T. ROSSE,
Aug. 4, 1986. *Director, Entry Procedures and Penalties Division.*

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**Department of Commerce**
**Patent and Trademark Office**
**37 CFR Part 2**
**[Docket No. 40557–6118]**
**Miscellaneous Amendments of Trademark Rules**

**Agency:** Patent and Trademark Office, Commerce.
**Action:** Final rule.
**Summary:** The Patent and Trademark Office is amending the rules of practice in trademark cases to correct two cross-references and a spelling error; to bring §§2.104 and 2.112(a) into conformity with sections 13 and 14 of the Trademark Act; to make §2.114(c), which relates to the withdrawal of a petition for cancellation, consistent with corresponding §2.106(c), which relates to the withdrawal of an opposition; and to specify that the Trademark Trial and Appeal Board may, in its discretion, grant a §2.132(a) motion even if the motion was filed after the opening of the testimony period of the moving party.
**Effective Date:** Sept. 10, 1986.
**For Further Information Contact:** Miss Janet E. Rice by telephone at (703) 557–3551 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Janet E. Rice, Crystal Square 5, Suite 1008, Washington, D.C. 20231.
**Supplementary Information:** Amendments to §§2.1, 2.101, 2.104, 2.112, 2.114, 2.132, and 2.145 were proposed in a rulemaking notice published in the **Federal Register** on June 11, 1984 at 49 FR 24033 and in the *Official Gazette* of July 3, 1984 at 1044 O.G. 2. Interested parties were requested to submit written comments on or before July 18, 1984. Written comments were submitted by one individual and one organization.

The purpose of these amendments is to make three "housekeeping" corrections; to bring the language of two rules into conformity with the corresponding provi-

sions of the Trademark Act of 1946; and to modify a particular practice.

Several of the rules of practice in trademark cases were amended, effective Feb. 27, 1983, by a final rule notice published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972 and in the *Official Gazette* of Feb. 22, 1983 at 1027 O.G. 129. A substantial number of other rules of practice in trademark cases were amended, effective June 22, 1983, by final rule notice published in the **Federal Register** on May 23, 1983 at 48 FR 23122 and in the *Official Gazette* of June 21, 1983 at 1031 O.G. 13. As a result of these rule amendments, three further rule amendments of a "housekeeping" nature are now necessary. First, because the rule amendments included changes in some section numbers and in the location of some provisions, the cross-reference portion of §§2.1 and 2.145(d)(1) are being corrected. Second, §2.101(b), as amended effective Feb. 27, 1983, contains a spelling error which is being corrected. Third, §2.114(c), which relates to the withdrawal of a petition for cancellation, is being amended so that it will be consistent with §2.106(c), as amended effective June 22, 1983, which relates to the withdrawal of an opposition.

Additionally, §2.104 (which lists the content requirements for an opposition) and §2.112(a) (which lists the content requirements for a petition for cancellation) are being amended to bring them into conformity with sections 13 and 14 of the Trademark Act. These amendments are being made as a result of a comment contained in the recent case of *Selva & Sons, Inc.* v. *Nina Footwear, Inc.*, 705 F.2d 1316, 217 USPQ 641 (Fed. Cir. 1983). The comment, which appears in footnote 6 at page 648, reads as follows:

> 37 CFR 2.112 commands that a petition for cancellation "set forth a short and plain statement showing how the petitioner is or will be damaged by the registration." This directive is not, however, reflective of 15 USC 1064, which states that a petition to cancel the registration of a mark may be filed "by any person who *believes* that he is or will be damaged by the registration." (Emphasis ours.) Nor is it consistent with recent case law, discussed infra.

Finally, §2.132, as amended effective June 22, 1983, permits any party in the position of defendant to file a motion to dismiss for failure to take testimony where plaintiff has either (1) failed to take testimony or offer any other evidence (§2.132(a)) or (2) offered no evidence other than copies of Patent and Trademark Office records and such evidence is insufficient to show that upon the law and the facts plaintiff is entitled to relief (§2.132(b)). Paragraph (c) of the section, adopted effective June 22, 1983, provides that any motion filed under paragraph (a) or (b) must be filed before the opening of the testimony period of the moving party. However, in those cases where a plaintiff's testimony period has expired and plaintiff has in fact failed to take testimony or offer any other evidence in his behalf, it is in the interests of justice and judicial economy to grant a motion to dismiss under §2.132(a) even if the motion was not filed until after the opening of the defendant's testimony period. Accordingly, the Patent and Trademark office is amending Rule §2.132(c) to specify that the Trademark Trial and Appeal Board may grant such a motion even if the motion was not filed until after the opening of the testimony period of the moving party.

**Discussion of Specific Sections Being Changed**

Section 2.1 provides in part that §§1.1 to 1.26 of Part I of Title 37 of the Code of Federal Regulations are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), 2.101(c) or 2.162(d). However, the pertinent provisions in §2.101(c) were relocated in modified form in §2.101(d) by amendment effective Feb. 27, 1983. Further by amendment effective Feb. 27, 1983, §2.111(c) adopted provisions which amplify that part of §2.85(e) relating to petitions for cancellation. Accordingly, the cross-reference portion of §2.1 is being amended by changing "§2.101(c)" to "§2.101(d)" and by adding a cross-reference to §2.111(c).

Section 2.101(b) is being amended by changing the spelling of the word "Principle" to "Principal".

Section 2.104 is being amended by deleting the requirement that the opposition "set forth a short and plain statement showing how the opposer would be damaged by the registration of the opposed mark" and substituting therefor a requirement that the opposition "set forth a short and plain statement showing why the opposer believes he would be damaged by the registration of the opposed mark." The subsitute requirement is in conformity with Section 13 of the Trademark Act, which states that any person "who believes that he would be damaged by the registration of a mark upon the principal register" may file an opposition in the Patent and Trademark Office.

Section 2.112(a) is being amended by deleting the requirement that the petition to cancel "set forth a short and plain statement showing how the petitioner is or will be damaged by the registration" and substituting therefor a requirement that the petition to cancel "set forth a short and plain statement showing why the petitioner believes he is or will be damaged by the registration." The substitute requirement is in conformity with section 14 of the Trademark Act, which states that a petition to cancel the registration of a mark may be filed "by any person who believes that he is or will be damaged by the registration."

Section 2.114(c), which provides in part that after an answer to a petition for cancellation is filed the petition may not be withdrawn without prejudice except with the consent of the registrant, is being amended to require the *written* consent of the registrant. The requirement is in conformity with the existing practice under § 2.114(c) and consistent with §2.106(c), which, as amended effective June 22, 1983, provides in part that after the answer to an opposition is filed, the opposition may not be withdrawn without prejudice except with the written consent of applicant.

Section 2.132(c), which provides that any motion filed under paragraph (a) or (b) of the section must be filed before the opening of the testimony period of the moving party, is being amended to specify that the Trademark Trial and Appeal Board may in its discretion grant a motion filed under paragraph (a) even if the motion was filed after the opening of the testimony period of the moving party.

Section 2.145(d)(1), which governs the time for filing an appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, provides in part that if a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §2.129(c) or §2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Prior to June 22, 1983, §2.129(c) governed the filing of any request for rehearing or reconsideration or modification of a decision of the Trademark Trial and Appeal Board, including a decision on a motion which is finally dispositive of a case. However, under the trademark rules as amended effective June 22, 1983, a request for rehearing or reconsideration or modification of a decision issued after final hearing is governed by §2.129(c), but a request for rehearing, etc., of a decision on a motion which is finally dispositive of a case is governed by §2.127(b). Accordingly, §2.145(d)(1) is being amended to include a cross-reference to §2.127(b).

**Response to Comments on the Rules**

Comments responding to the notice of proposed rulemaking were submitted by the committee of one or-

ganization and by one individual. These comments have been given careful consideration. However, the only suggested modification has not been adopted.

*Comment:* The organization's committee indicated that while it believed that some of the proposed amendments would have a substantive effect on practice before the Patent and Trademark Office, it found no reason not to endorse their enactment.

*Response:* The Patent and Trademark Office agrees that some of the amendments will have a substantive effect on practice before the Office.

*Comment:* With respect to the proposal to amend §§2.104 and 2.112(a) to bring them into conformity with the language of sections 13 and 14 of the Act relating to standing, i.e., to require that an opposition and a petition for cancellation, respectively, set forth a short and plain statement showing why the plaintiff believes he would be damaged by the registration of the mark in question, one individual, noting ". . . the recent changes in the 'standing' doctrine from a 'damage' showing to a 'real interest in the proceeding' showing, . . .", suggested that it might be less confusing if the two rules were amended to provide that opposers and petitioners must set forth a statement showing why (or how) they have " a real interest in the proceeding" rather than why they believe they will be damaged.

*Response:* The suggested modification is appealing because it reflects current case law. Nevertheless, since case law interpretation of statutory provisions is subject to change, it is concluded that the better approach is to incorporate into the rules the statutory wording, rather than case law language. Further, inasmuch as the "real interest" language is a legal concept which has no specific meaning apart from case law, it appears that the statutory "belief in damage" language is the more readily understandable way of expressing the standing requirement. Accordingly, the suggested modification has not been adopted.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rule change includes no additional or increased fees. Substantive rights to use valuable trademarks are not adversely affected.

This rule change does not contain a collection of information requirements under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant, adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign based enterprises in domestic or export markets.

**List of Subject Terms in 37 CFR Part 2**

Administrative practice and procedures, Courts, Lawyers, Trademark.

After consideration of the comments received and pursuant to the authority contained in Section 41 of the Trademark Act of July 5, 1946, as amended, and in 35 U.S.C. 6, Part 2 of Title 37 of the Code of Federal Regulations is amended as set forth below.

## PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 is revised to read as follows:

**Authority:** 15 U.S.C. 1123, 35 U.S.C. 6, unless otherwise noted.

2. Section 2.1 is revised to read as follows:

**§2.1 Sections of Part 1 applicable.**

Sections 1.1 to 1.26 of this chapter are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), 2.101(d), 2.111(c) or §2.162(d). Other sections of Part 1 incorporated by reference or referred to in particular sections of this part are also applicable to trademark cases.

3. Section 2.101 is amended by revising paragraph (b) to read as follows:

**§2.101 Filing an opposition.**

* * * * *

(b) Any person who believes that he would be damaged by the registration of a mark on the Principal Register may oppose the same by filing an opposition which should be addressed to the Trademark Trial and Appeal Board.

* * * * *

4. Section 2.104 is revised to read as follows:

**§2.104 Contents of opposition.**

The opposition must set forth a short and plain statement showing why the opposer believes he would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition, including exhibits, shall be filed with the opposition.

5. Section 2.112 is amended by revising paragraph (a) to read as follows:

**§2.112 Contents of petition for cancellation.**

(a) The petition to cancel must set forth a short and plain statement showing why the petitioner believes he is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition.

* * * * *

6. Section 2.114 is amended by revising paragraph (c) to read as follows:

**§2.114 Answer.**

* * * * *

(c) The petition for cancellation may be withdrawn without prejudice before the answer is filed. After the answer is filed, the petition may not be withdrawn without prejudice except with the written consent of the registrant.

7. Section 2.132 is amended by revising paragraph (c) to read as follows:

**§2.132 Involuntary dismissal for failure to take testimony.**

* * * * *

(c) A motion filed under paragraph (a) or (b) of this section must be filed before the opening of the testimony period of the moving party, except that the Trademark Trial and Appeal Board may in its discretion grant a motion under paragraph (a) even if the motion was filed after the opening of the testimony period of the moving party.

8. Section 2.145 is amended by revising paragraph (d)(1) to read as follows:

**§2.145 Appeal to court and civil action.**

* * * * *

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

* * * * *

DONALD J. QUIGG,
June 20, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 86-17998 Filed 8-8-86; 8:45 am]
**Billing Code 3510-16-M**

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**New Trademark Fees**

Effective Oct. 4, 1986, the trademark fee schedule (Rule 2.6, 37 CFR §2.6), is as follows:

| | | |
|---|---|---|
| (a) | For filing an application, per class | $200.00 |
| (b) | For filing an appliclation for renewal of a registration, per class | 300.00 |
| (c) | For filing to publish a mark under section 12(c), per class | 100.00 |
| (d) | For issuing a new certificate of registration upon request of assignee | 100.00 |
| (e) | For a certificate of correction of registrant's error | 100.00 |
| (f) | For filing a disclaimer to a registration | 100.00 |
| (g) | For filing an amendment to a registration | 100.00 |
| (h) | For filing an affidavit under §8 of the Act, per class | 100.00 |
| (i) | For filing an affidavit under §15 of the Act, per class | 100.00 |
| (j) | For filing a combined affidavit under §§8 and 15 of the Act, per class | 200.00 |
| (k) | For petitions to the Commissioner | 100.00 |
| (l) | For filing petition to cancel or notice of opposition, per class | 200.00 |
| (m) | For ex parte appeal to the Trademark Trial and Appeal Board, per class | 100.00 |
| (n) | For printed copy of registered mark<br>Copy only<br>Copy showing title and/or status | 1.50<br>6.50 |
| (o) | For certifying trademark records, per certificate<br>For expedited handling of such certification, per record requested | 3.50<br>25.00 |
| (p) | For photocopies or other reproductions of records, drawing, or printed material, per page of the material copied | 0.30 |
| (q) | For recording trademark assignments and agreements or other papers relating to the property in a registration or application, per document<br>For each mark in addition to one assigned in the same document | 100.00<br>20.00 |
| (r) | For abstracts of title to each registration or application, including the search | 12.00 |
| (s) | For special service handling of late filed fees in connection with a renewal | 100.00 |
| (t) | For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service | actual cost. |

MARGARET M. LAURENCE,
Aug. 15, 1986. *Assistant Commissioner, for Trademarks.*

# PATENT NOTICES

**Certificates of Correction for the Week of Sept. 9, 1986**

| | | | |
|---|---|---|---|
| Re. 32,058 | 4,542,250 | 4,578,634 | 4,590,219 |
| Re. 32,125 | 4,544,269 | 4,578,716 | 4,590,463 |
| Re. 32,127 | 4,545,856 | 4,579,773 | 4,590,507 |
| D. 282,830 | 4,546,446 | 4,579,858 | 4,590,533 |
| D. 282,918 | 4,547,628 | 4,580,706 | 4,590,587 |
| 4,154,830 | 4,549,104 | 4,580,752 | 4,590,805 |
| 4,160,028 | 4,549,114 | 4,581,236 | 4,591,280 |
| 4,269,618 | 4,550,542 | 4,581,362 | 4,591,313 |
| 4,353,241 | 4,552,314 | 4,582,093 | 4,592,087 |
| 4,356,270 | 4,555,368 | 4,582,283 | 4,592,972 |
| 4,402,245 | 4,556,507 | 4,582,565 | 4,593,084 |
| 4,444,964 | 4,556,991 | 4,583,363 | 4,593,267 |
| 4,452,883 | 4,557,580 | 4,584,140 | 4,593,759 |
| 4,455,653 | 4,558,382 | 4,584,509 | 4,594,170 |
| 4,470,692 | 4,559,301 | 4,585,801 | 4,594,406 |
| 4,483,658 | 4,560,240 | 4,587,065 | 4,594,710 |
| 4,491,797 | 4,560,817 | 4,587,136 | 4,594,780 |
| 4,494,270 | 4,562,724 | 4,587,161 | 4,594,804 |
| 4,494,861 | 4,564,284 | 4,588,234 | 4,594,948 |
| 4,499,480 | 4,566,036 | 4,588,357 | 4,595,029 |
| 4,512,434 | 4,566,692 | 4,588,373 | 4,595,227 |
| 4,517,012 | 4,568,873 | 4,588,390 | 4,595,327 |
| 4,517,199 | 4,569,416 | 4,588,570 | 4,595,400 |
| 4,517,967 | 4,571,688 | 4,588,634 | 4,595,494 |
| 4,519,550 | 4,572,847 | 4,588,726 | 4,595,634 |
| 4,520,296 | 4,575,256 | 4,588,962 | 4,595,714 |
| 4,532,457 | 4,575,454 | 4,589,174 | 4,595,750 |
| 4,534,959 | 4,578,053 | 4,589,361 | 4,595,901 |
| 4,537,110 | 4,578,079 | 4,589,465 | 4,596,106 |
| 4,537,623 | 4,578,313 | 4,589,471 | 4,596,637 |
| 4,537,717 | 4,578,377 | 4,589,800 | |

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| Arizona | Tempe: Noble Library, Arizona State University | (602) 965-7609 |
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*Collection organized by subject matter.

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**RENE D. TEGTMEYER, Assistant Commissioner**

**JAMES E. DENNY, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF August 2, 1986**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director | 4-01-85 |
| ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director | 2-24-84 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director | 4-01-85 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director | 3-08-85 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director | 10-09-84 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director | 4-11-84 |
| INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director | 11-21-83 |
| PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director | 3-20-85 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director | 11-09-83 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director | 9-26-83 |
| DESIGN, GROUP 290—K. L. CAGE, Director | 2-06-84 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director | 8-24-84 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director | 12-24-84 |
| MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director | 5-21-84 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director | 2-25-85 |
| GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director | 1-02-86 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during August 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,458,863 to 3,464,062, inclusive

**Plant Patents** ..... Numbers 2,914 to 2,917 inclusive

# REISSUES

## SEPTEMBER 9, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 32,241
### FRACTIONAL CRYSTALLIZATION PROCESS

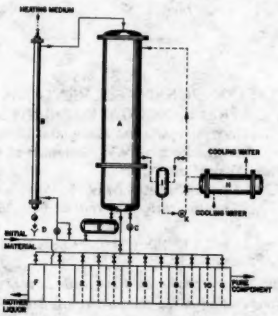
**Kurt Saxer, Buchs, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Original No. 3,621,664, dated Nov. 23, 1971, Ser. No. 720,553, Apr. 11, 1968. Application for reissue Apr. 18, 1984, Ser. No. 601,785**

**Claims priority, application Austria, Apr. 14, 1967, 3510/67**

**Int. Cl. B01D *9/00***

**U.S. Cl. 62—542** **3 Claims**




1. A method of segregating a high melting point ingredient of an initial liquid mixture of high and low melting point ingredients by a fractional crystallization procedure carried out on amounts of said mixture of successively higher concentration of said high melting point ingredient contained in a corresponding series of vessels, comprising in a cycle of operation as a first step the passing of an amount of the mixture contained in the first vessel of said series of vessels over a cooled surface thereby causing formation of a layer of crystals of said high melting point ingredient on said cooled surface, and draining the remainder of said mixture into a vessel for mother liquor, as a second step for passing of [an] *a* heated amount of the mixture contained in the second vessel of said series of vessels over said layer of crystals while suspending the cooling of said surface thereby melting said crystals, *recommencing cooling of said surface and circulating the mixture to form a layer of crystals on the cooled surface,* and returning the resulting liquid mixture to said first vessel, repeating [said second step] *the same procedures beginning with the aforementioned second step but with mixture contained in each succeeding vessel of said series of vessels and* with mixture from each succeeding vessel returned to the respective preceding vessel until the contents of the next to the last vessel of said series of vessels has been crystallized on said cooled surface and the remaining mixture has been returned to the next preceding vessel, the layer of crystals on said cooled surface then being of the required concentration, passing the mixture contained in the last vessel of said series of vessels in heated condition over said last mentioned layer of crystals and returning a first portion of the resulting mixture to said next to the last vessel until filled, a second portion to the last vessel until filled, and a third portion to a place of use or storage, draining said vessel for mother liquor, filling said first vessel with another supply of said initial liquid mixture which completes said cycle of opertions, and repeating said cycle of operations as required.

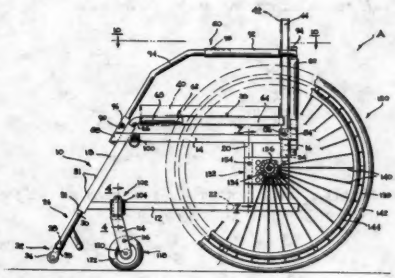
### Re. 32,242
### WHEELCHAIR CONSTRUCTION

**Jeffrey P. Minnebraker, Van Nuys, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.**

**Original No. 4,351,540, dated Sep. 28, 1982, Ser. No. 206,346, Nov. 13, 1980. Application for reissue Sep. 24, 1984, Ser. No. 653,151**

**Int. Cl.[4] A61G *5/02***

**U.S. Cl. 280—242 WC** **66 Claims**



*48. An apparatus for selectively positioning the main driving wheels of a wheelchair having a frame to selectively alter the center of gravity thereof, said apparatus comprising:*

*(a) a bracket having means having a plurality of spaced apart axle holes extending therethrough and provided for attachment to one side of said frame and which holes are sized so as to be capable of receiving a rear wheel axle,*

*(b) a second bracket having means having a plurality of axle receiving holes extending therethrough and provided for attachment to an opposite side of said frame and which holes are sized so as to be capable of receiving a wheel axle,*

*(c) a separate wheel axle capable of extending outwardly from any one of the wheel axle holes in each of said brackets,*

*(d) means for attachment of said brackets to a frame means of said wheelchair, and*

(e) a separate quick release means associated with each of said wheel axles to enable quick release and replacement of the driving wheels on said wheel axles, each of said quick release means comprising a manually actuatable element which operates to permit release of the axle from the hole when actuated and which permits re-*insertion into the same or another hole by pushing the axle into said same or another hole where it becomes locked therein, such that each of said axles can be easily removed from a hole in a bracket and replaced in another axle receiving hole in said bracket so that the response and center of gravity and wheel base on said frame can be easily and quickly altered.*

Re. 32,243

## ESTERS OF SUBSTITUTED PHENOXYBENZOIC ACIDS, COMPOSITIONS OF THE SAME AND HERBICIDAL USE THEREOF

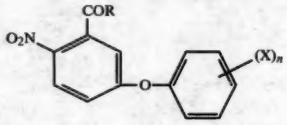
**Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France**

**Original No. 4,164,410, dated Aug. 14, 1979, Ser. No. 903,366, May 5, 1978. Continuation of Ser. No. 279,279, Jun. 25, 1981, abandoned, which is a continuation of Ser. No. 837,957, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 702,367, Jul. 2, 1976, which is a continuation-in-part of Ser. No. 617,569, Sep. 29, 1971, Pat. No. 3,979,437, which is a continuation of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645, said Ser. No. 702,367, is a continuation-in-part of Ser. No. 545,233, Jan. 29, 1975, Pat. No. 4,002,662, which is a continuation-in-part of Ser. No. 398,610,. Application for reissue Feb. 23, 1983, Ser. No. 469,564**

**Int. Cl.[4] A01N** *33/22;* **C07C** *79/35*

**U.S. Cl. 71—98** **6 Claims**

*4. Herbicidal compounds having the formula:*




*wherein $(X)_n$ is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,*

*(alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms,*

*SH, $SR_1$, $SOR_1$, $SO_2R_1$, $SO_2NH_2$, $R_1$ and $R_2$ are selected from the group consisting of alkyl of 1 to 4 carbon atoms, R is alkoxy of 1 to 5 carbon atoms, and n is an integer of 2 to 5.*

*5. The method for controlling plant growth that comprises applying an herbicidal amount of a compound defined in claim 4.*

*6. An herbicidal composition comprising a carrier for an herbicide and an herbicidal amount of a compound defined in claim 4.*

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Re. 32,244

## METHODS AND APPARATUS FOR APPLYING WEAR RESISTANT COATINGS TO ROTOGRAVURE CYLINDERS

**Dennis Andersen, Medford, N.J., assignor to Armotek Industries, Inc., Palmyra, N.J.**

**Original No. 4,262,034, dated Apr. 14, 1981, Ser. No. 89,474, Oct. 30, 1979. Application for reissue Sep. 29, 1982, Ser. No. 426,959**

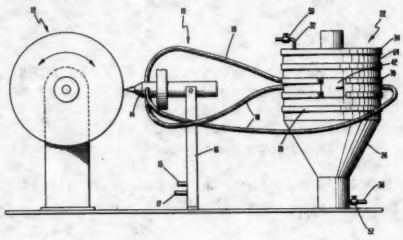
**Int. Cl.[4] B05D** *1/08*

**U.S. Cl. 427—34** **33 Claims**

*33. A method for applying a coating of wear-resistant material to a roto-gravure cylinder comprising the steps of:*

*suspending powder particles of said wear-resistant material in a gas flow within a hopper such that particles having a diameter of from 1 to 8 microns are suspended at a substantially uniform density adjacent a powder discharge of said hopper,*

*conducting said suspended particles from said discharge to a plasma flame spray torch, and melting said particles in said torch and spraying the melt against the surface of the work-*



*piece to form a wear-resistant coating of from 15 to 35 microns thickness thereon.*

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Re. 32,245

## MULTI-COMPONENT SOLVENTLESS SILICONE RELEASE COATING SYSTEM

**Maurice E. Grenoble, Ballston Lake, and Richard P. Eckberg, Saratoga Springs, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Original No. 4,448,815, dated May 15, 1984, Ser. No. 4,58,,421, Jan. 17, 1983. Application for reissue Feb. 25, 1985, Ser. No. 706,206**

**Int. Cl.[4] B05D** *3/02;* **C08L** *83/07*

**U.S. Cl. 427—387** **57 Claims**

*50. A process for providing a substrate having a silicone release coating composition cured thereon, comprising:*

*(I) mixing:*

*(a) a first component which comprises an olefinorganopolysiloxane or a silanol end-stopped organopolysiloxane base polymer and an amount of precious metal or precious metal complex catalyst effective for promoting a hydrosilation cure reaction or an amount of inhibitor effective for retarding a hydrosilation cure reaction at ambient temperature but which does not interfere with such reaction at elevated temperatures, and*

*(b) a second component which comprises an organohydrogenpolysiloxane cross-linking agent and an amount of precious metal or precious metal complex catalyst effective for promoting a hydrosilation cure reaction or an amount of inhibitor effective for retarding a hydrosilation cure reaction at ambient temperature but which does not interfere with such reaction at elevated temperatures,*

*with the proviso that if said first component contains a catalyst, said second component contains an inhibitor, and if said first component contains an inhibitor, said second component contains a catalyst, and wherein prior to use said first and second components are contained separate from one another,*

*(II) applying a coating of the mixture obtained from (I) to a suitable substrate, and*

*(III) curing said coating to said substrate.*

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Re. 32,246

## BORATED EPOXIDES AND LUBRICANTS CONTAINING SAME

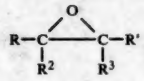
**Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Original No. 4,410,438, dated Oct. 18, 1983, Ser. No. 329,774, Dec. 11, 1981. Application for reissue Oct. 29, 1985, Ser. No. 792,351**

**Int. Cl.[4] C10M** *1/20, 1/54*

**U.S. Cl. 252—49.6** **19 Claims**

1. A product of reaction made by reacting (1) an epoxide of the formula



wherein R, R', $R^2$ and $R^3$ are hydrogen or hydrocarbyl groups containing from 8 to 30 carbon atoms, at least one of which is hydrocarbyl, with (2) a boron compound selected from boric acid, boric oxide and an alkyl borate of the formula

$$(RO)_xB(OH)_y$$

wherein x is 1 to 3, y is 0 to 2, their sum being 3, and R is an alkyl group having 1 to 6 carbon atoms, the reaction being carried out at from about 80° C. to about 260° C. using a molar ratio of epoxide to boron compound of from about 0.2 to 1 to about [4] *1.5* to 1, respectively.

# PATENTS

## GRANTED SEP. 9, 1986

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 101–223 | 4,610,198 |
| 175–320 | 4,610,307 |
| 209–555 | 4,610,361 |
| 221–155 | 4,610,373 |
| 296–097 | 4,610,443 |
| 384–007 | 4,610,486 |
| 384–018 | 4,610,487 |
| 384–045 | 4,610,488 |
| 530–380 | 4,610,814 |
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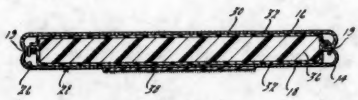
| 549–452 | 4,610,816 |
| 514–002 | 4,610,817 |
| 514–019 | 4,610,818 |
| 540–488 | 4,610,819 |
| 540–200 | 4,610,820 |
| 540–200 | 4,610,821 |
| 540–316 | 4,610,822 |
| 540–350 | 4,610,823 |
| 540–355 | 4,610,824 |
| 558–044 | 4,610,826 |
| 426–641 | 4,610,844 |
| 358–140 | 4,611,225 |
| 358–144 | 4,611,226 |
| 358–147 | 4,611,227 |
| 358–149 | 4,611,228 |
| 358–158 | 4,611,229 |
| 358–158 | 4,611,230 |
| 358–160 | 4,611,231 |
| 358–160 | 4,611,232 |
| 358–160 | 4,611,233 |
| 358–213 | 4,611,234 |
| 365–189 | 4,611,299 |
| 365–194 | 4,611,300 |
| 365–207 | 4,611,301 |
| 365–229 | 4,611,302 |
| 365–230 | 4,611,303 |

# PATENTS

## GRANTED SEPTEMBER 9, 1986

## GENERAL AND MECHANICAL

**4,610,034**
**SHOULDER PROTECTION DEVICE**
**Sam E. Johnson, 1519 Westbury Dr., Davison, Mich. 48423**
**Continuation-in-part of Ser. No. 415,607, Sep. 7, 1982, Pat. No. 4,455,684. This application Jun. 22, 1984, Ser. No. 623,444**
**The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.**
**Int. Cl.[4] A41D *13/00*; B32B *3/10***
**U.S. Cl. 2—2** **36 Claims**



1. A shoulder protection device having a cover portion, and an energy absorbing pad carried within said cover portion and comprising a lightweight resilient soft polyurethane elastomer solid internal matrix for absorbing and dissipating recoil forces generated during the dischargeof a firearm.

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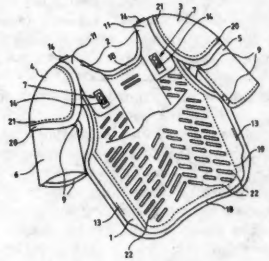
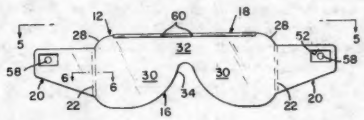
**4,610,035**
**UPPER BODY PROTECTOR**
**Heikki Mattila, SF-89200 Poulanka, Finland**
**Filed Jun. 17, 1985, Ser. No. 745,123**
**Int. Cl.[4] A41D *13/00***
**U.S. Cl. 2—2** **7 Claims**



1. An upper body protector, comprising a semi-rigid upper body shield having a chest plate portion, a suspender portion, and left and right shoulder portions, said chest plate portion adapted to comfortably embrace the chest of a wearer and said suspender portion adapted to be embrace the shoulders of the wearer, said left and right shoulder portions adapted to comfortably embrace the shoulders of the wearer, left and right upper arm portions connected to the respective left and right shoulder portions, first adjustable connecting means connecting said suspender portion and said chest plate portion so that said chest plate position is adjustable in a generally vertical manner with respect to said suspender portion, second adjustable connecting means to connect said left and right shoulder portions to said suspender portions so that the shoulder portions are adjustable with respect to the width of the shoulders of the wearer, said adjustable connecting means each including a threaded fastener extending through corresponding holes in the parts of the protector to be adjustably connected and a connector threaded on the threaded fastener, attaching means connected to the chest plate for securing the chest plate to the body of the wearer, and elastic band means associated with each upper arm portion for holding said upper arm portions to the arms of the wearer.

**4,610,036**
**SUNGLASSES**
**Brian B. LaPrairie, 44 Mayfield St., Dover, Pa. 17315**
**Filed Sep. 4, 1985, Ser. No. 772,444**
**Int. Cl.[4] A61F *9/04***
**U.S. Cl. 2—12** **8 Claims**



1. A pair of plastic glasses including a one-piece injection molded plastic lens and temple piece having an elongate lens portion, a pair of temple portions at the ends of the lens portion and a pair of straight hourglass hinges extending transversely of the lens and temple piece and joining the temple portions to the lens portion, the lens portion having a narrow central bridge and a pair of wide viewing lenses located between the bridge and the hinges, and a stiffening bar extending along the top of the viewing lenses and bridge, each temple portion extending a distance away from the adjacent hinge, said viewing lenses, bridge and temple portions all being formed from essentially uniform thickness light transmitting and optically clear plastic free of knit lines extending, with the exception of the stiffening bar, continuously from the top to the bottom of the lens and temple piece and, with the exception of the hinges, from the end of one temple portion across the lens portion to the end of the opposite temple portion, whereby the lens and temple piece is light transmitting through optically clear surfaces and forms a continuing shield surrounding the eyes from temple to temple; and a pair of earpieces adjustably mounted to the temple portions at locations away from the hinges.

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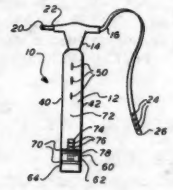
**4,610,037**
**TIE CONSTRUCTION**
**Xavier Haymer, 2113 W. Broadway, Forrest City, Ark. 72335**
**Continuation of Ser. No. 517,701, Jul. 27, 1983. This application Feb. 22, 1985, Ser. No. 704,905**
**Int. Cl.[4] A41D *25/02***
**U.S. Cl. 2—145** **5 Claims**



1. A tie of the type intended to be worn by wearer with a shirt having buttons and buttonholes arranged at intervals along with front of the shirt, the tie comprising:

(a) a single tie panel formed with relatively straight sides and stitching extending proximate and along each side and providing the appearance of shirt front stitching; said tie panel includes a lower end which is tapered inwardly for a predetermined length thereof and securing means are provided to secure said lower end of said tie panel in a bent under manner behind said tie panel; said securing means includes at least one securing strap formed of a predetermined material and securing button attached to the rear face of said tie panel and includes a patch of

material attached to said rear face of said tie panel and a plurality of buttonholes formed in said patch of material or cooperation with said securing button;

(b) tie knot means connected proximate a predetermined end of said tie panel;

(c) a neckband connected to said tie knot means and formed to fasten said tie knot means about the neck of the wearer so that said tie panel extends down from said tie knot means in front of the shirt when worn by the wearer;

(d) said tie panel includes a plurality of buttonholes extending therethrough and spaced from each other end sized to receive through the buttons of the shirt of the wearer so that when so disposed the buttons of the shirt are, when passed through said tie panel buttonholes, in front of said tie panel and secured said tie panel to the shirt.

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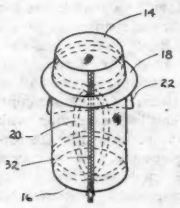
**4,610,038**

## HAT/TOTE BAG COMBINATION ARTICLE

**David G. Dennard, 50 Herron Cove Rd., Weaverville, N.C. 28787**

**Filed Jun. 3, 1985, Ser. No. 740,570**
**Int. Cl.[4] A42B *1/20***
**U.S. Cl. 2—209.1** **9 Claims**




1. A hat/tote bag combination article comprising: a tubular member having a body portion and first and second closed ends, part of said body portion and said first closed end forming a crown said body portion having an encircling brim secured thereto thereby functioning as a hat when a part of said body portion and said second closed end are folded into and nested within said crown.

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**4,610,039**

## WASTE CONTAINER

**Leif E. Stern, Fattershus, S-225 90 Lund, Sweden**

**Filed Jan. 17, 1985, Ser. No. 692,406**
**Claims priority, application Sweden, Jan. 20, 1984, 8400265**
**Int. Cl.[4] A61J *19/00***
**U.S. Cl. 4—285** **9 Claims**

1. A hand-held waste container for collecting vomit and the like, said waste container comprising:

a tubular rim having an upper edge and a lower edge;

a waste bag attached to said upper edge of said tubular rim, and extending downwardly through said tubular rim and past said lower edge, said waste bag being kept open by tubular rim;

said tubular rim being dimensioned such that when said waste bag is closed by depressing said lower edge against said waste bag when said waste container is deposited on a support, then an upper portion of said waste bag extends diagonally across said tubular rim from said upper edge to said lower edge.

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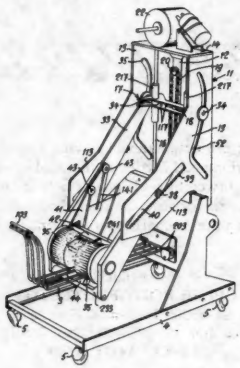
**4,610,040**

## AUTOMATIC FEET WASHING AND MASSAGING MACHINE

**Antonio Concato, Genova Pegli, Italy, assignor to Sander S.R.L., Genoa, Italy**

**Filed Mar. 6, 1985, Ser. No. 708,821**
**Claims priority, application Italy, Mar. 13, 1984, 12458 A/84**
**Int. Cl.[4] A47K *3/022***
**U.S. Cl. 4—622** **12 Claims**



1. An automatic feet washing and massaging machine comprising a basin for at least one foot, means for filling the said basin with water and for discharging the water from the basin, and a plurality of brushes acting upon the foot put in the basin, the plurality brushes being mounted on at least one movable brush-carrying arm which is introduced from above in the basin, and is driven by a driving unit of which at least its electric motor is placed on a support outside of the basin at a certain height thereover, said unit for operating the brush-carrying arm being made in such a manner as to impart to the brush-carrying arm a reciprocating motion, whereby the brushes mounted on the brush-carrying arm are moved to and fro along the foot put in the basin, two said brush-carrying arms being associated with each foot put in the basin, and said two arms being arranged at both sides of the respective foot, said brush-carrying arms carrying at least one downwardly turned upper brush, at least one upwardly turned lower brush, and two side brushes which are turned the one toward the other, the unit for driving the brush-carrying arms being constructed in such a manner that the upper brush is moved along the dorsum of foot, while the lower brush is moved along the plant of foot and around its heel, and the two side brushes are moved along the sides of foot up to and beyond the region of the ankle.

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**4,610,041**

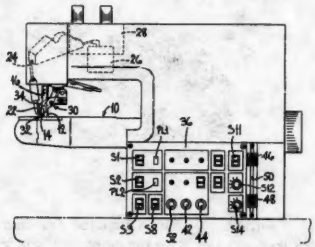
## FOLDING MACHINES

**Robert Yardley, Thurmaston; Ewen R. Cameron, Oadby, and Frank H. Wolloff, Birstall, all of United Kingdom, assignors to Enhart Corporation, Hartford, Conn.**

**Filed Jun. 14, 1984, Ser. No. 621,361**
**Claims priority, application United Kingdom, Jun. 22, 1983, 8316899**
**Int. Cl.[4] A43D *11/00*; D05B *27/00***
**U.S. Cl. 12—55.1** **5 Claims**

1. A folding machine comprising folding instrumentalities for folding the edge of a workpiece fed therepast, workpiece feeding means by which a workpiece can be fed in a succession

of feed steps to move the edge of the workpiece past the folding instrumentalities, feed speed control means for controlling the speed at which the workpiece feeding means is caused to operate, feed length control means for controlling the length of each feed step of the workpiece feeding means, workpiece sensing means for sensing an "outside" corner of the edge of the workpiece when the same approaches said folding instrumentalities whereby said feed length control means is actuated



in response thereto so as to reduce the feed length independently of the speed at which the workpiece feeding means is operating, the feed length control means being thereafter deactuated in response to said sensing means no longer sensing such "outside" corner, and delay means for delaying the deactuation of the feed length control means as aforesaid for a pre-determined number of feed steps of the workpiece feeding means, following the sensing means no longer sensing such "outside" corner.

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**4,610,042**

**METHOD AND APPARATUS FOR MAKING DISPOSABLE SHOE COVERS**

**Theodore E. Theodorsen, Manhasset, N.Y., assignor to Kurt Salmon Associates, Inc., New York, N.Y.**

**Filed Dec. 19, 1984, Ser. No. 683,605**

**Int. Cl.[4] A43B *3/16*; A43D *97/00***

**U.S. Cl. 12—142 R** **19 Claims**

13. A method for forming individual shoe covers, comprising:

moving a web of fabric material from two continuous sources of supply;

applying an adhesive at longitudinally spaced increments to at least one of said webs of fabric material along the width of the web between a first lateral edge and a second lateral edge of the web;

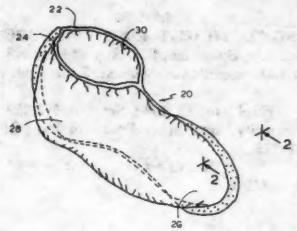
initially pressing said webs together to adhere said webs together and form adhesively joined segments at said longitudinally spaced increments;

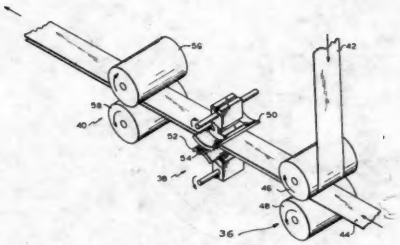
after the applying and initial pressing steps, producing holes substantially simultaneously in each of said webs at said adhesively joined segments;

subsequently pressing said webs together after producing the holes;

sewing said first lateral edges of said joined webs together along a discrete length thereof which is less than the length between adjacent adhesively joined segments to define an opening along said first lateral edges between said webs of fabric material;

sewing the second lateral edges of said joined webs together along the length thereof which is at least the length between adjacent adhesively joined segments; and





severing said joined webs of material within said adhesively joined segments to form individual shoe cover members.

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**4,610,043**

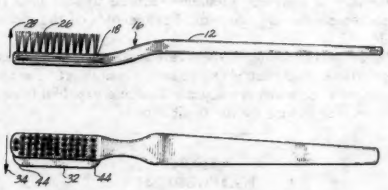
**ORAL HYGIENE BRUSH**

**William Vezjak, 10549 Moorpark St., North Hollywood, Calif. 91602**

**Filed Jul. 17, 1985, Ser. No. 756,051**

**Int. Cl.[4] A46B *9/04***

**U.S. Cl. 15—111** **6 Claims**



1. A tooth brush and plaque scraper for a human oral cavity comprising:

a rigid handle adapted to be grasped by a user;

a rigid base portion at a first end of the handle, extending away from the handle and having a top surface, at least one side surface and a bottom surface wherein the top, bottom and at least one side surface each comprise substantially uniform surfaces;

bristles mounted to the top surface wherein the base portion and the bristles are adapted to be placed in the oral cavity for brushing teeth and wherein the bristles extend in a first direction; and

a single rigid blade converging to a relatively sharp, pointed scraping edge in a second direction substantially perpendicular to the first direction contiguous to the at least one side surface, the scraping edge having a constant width in

the second direction for essentially the entire length of the base portion.

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**4,610,044**

## WIPING CLOTH WITH EDGE REINFORCEMENT

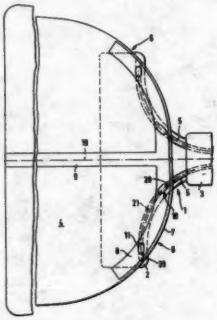
**Rolf G. Schulein, Singhofen, Fed. Rep. of Germany, assignor to Leifheit Aktiengesellschaft, Nassau/Lahn, Fed. Rep. of Germany**

**Filed Nov. 13, 1984, Ser. No. 670,859**

**Claims priority, application European Pat. Off., Nov. 19, 1983, 83111575**

**Int. Cl.[4] A47L *13/20***

**U.S. Cl. 15—119 R** **9 Claims**



1. A wiping cloth for use in a cleaning device of the kind which includes a pair of movable flexible rods for supporting the cloth at a working position to clean a floor surface and for retracting the cloth within an associated squeezing device to wring the cloth of a floor cleaning liquid, the rods diverging arcuately from a central axis when supporting the cloth at said working position and flexing when moved to retract the cloth within or expel the cloth from said squeezing device, said wiping cloth comprising:

a cloth having a front edge;

a hem reinforcement fixed along said front edge of said cloth; and

a number of fastening elements secured to said hem reinforcement for engaging the flexible rods of the cleaning device;

wherein said fastening elements are arranged asymmetrically relative to said central axis so as to avoid interference with one another when retracted within and expelled from the squeezing device by the flexible rods.

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**4,610,045**

## TOOTHBRUSH

**Samuel Rauch, 40 Spruce St., Cedarhurst, N.Y. 11516**

**Continuation-in-part of Ser. No. 370,460, Apr. 11, 1982, Pat. No. 4,472,853. This application Jul. 12, 1984, Ser. No. 630,062**

**Int. Cl.[4] A46B *9/04***

**U.S. Cl. 15—167 R** **25 Claims**

1. An improved toothbrush for cleaning teeth and automatic and simultaneously cleaning under the sulcus and cleaning, massaging and stimulation the gums which comprises:

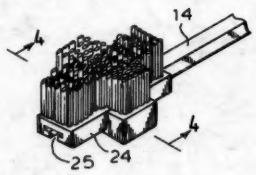
a first brush body;

an elongated handle extending from the first brush body;

a plurality of bristles having ends projecting from the first brush body defining a teeth brushing surface;

an outrigger comprising a second brush body;

a plurality of bristles having first ends embedded in the second brush body and second ends projecting therefrom defining gum treatment brush surface fitting on both sides of the tooth brushing surface, the relationship of the bristle ends are such that the teeth brushing surface primarily contacts the teeth and the gum treatment brush surface primarily contacts the gum tissue during horizontal brushing, the gum treatment brush surface being adapted to apply less brushing pressure on gums than the teeth brushing surface applies to the teeth: the difference in brushing pressure being accomplished for each surface by varying at least one of bristle length, diameter, spacing, cross section, material and end configuration and the brush head




being of a sufficient width so that the first and second brush bodies cooperate with the elongated handle to provide an overturning moment when the upper or lower teeth are brushed requiring the user to push the brushing surfaces into the buccal corridor and causing a rotation of the brush body about the handle axis to approximately 45° which results in cleaning under the sulcus in the Bass (Stillman) toothbrushing technique.

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**4,610,046**

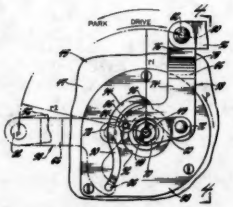
## VARIABLE THROW CRANK ARM ASSEMBLY FOR WINDSHIELD WIPER DRIVE

**Jeffrey J. Buschur, Beavercreek; Ernest G. Franklin, Kettering, and William S. Shufflebarger, Beavercreek, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 16, 1985, Ser. No. 691,921**

**Int. Cl.[4] B60S *1/26***

**U.S. Cl. 15—250.16** **2 Claims**




1. In a windshield wiper system on a vehicle body including a wiper arm pivotable on said body about a first axis, a drive link connected to said wiper arm and operative during reciprocation to pivot said wiper arm, and an electric motor having a drive shaft rotatable in opposite directions on a second axis of said body, a variable throw crank arm assembly comprising, a first arm rigidly attached to said drive shaft having a first pivot joint means thereon orbiting in a circle about said second axis during rotation of said drive shaft, a second arm having second pivot joint means thereon, means attaching said second arm to said first arm at said first pivot joint means for rotation with said first arm and for pivotal movement relative thereto between a short-throw folded position wherein said second pivot joint means is disposed at a first radius from said second axis and a long-throw unfolded position wherein said second pivot joint means is disposed at a larger second radius from said second axis, means connecting a distal end of said drive link to said second arm at said second pivot joint means, a guide follower on said second arm, and guide means on a housing

portion of said motor defining a guide channel having a circular portion centered on said second axis and a noncircular escape portion radially outboard of said circular portion and merging therewith at a junction, said guide follower traversing said circular portion during continuous rotation of said drive shaft in one direction to maintain said second arm in said folded position so that said drive link reciprocates through a plurality of strokes having a first amplitude and automatically entering said escape portion through said junction in response to rotation of said drive shaft in the opposite direction to effect pivotal movement of said second arm to said unfolded position concurrently with rotation of said drive shaft in the opposite direction so that said drive link reciprocates through a final stroke having a second amplitude greater than said first amplitude.

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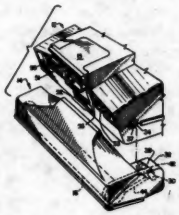
**4,610,047**

## VACUUM CLEANER OF INTERCHANGEABLE ATTACHMENT TYPE

**Larry C. Dick, North Olmsted, and Ernest R. Scott, Mayfield Heights, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio**

**Filed Apr. 11, 1985, Ser. No. 722,316**
**Int. Cl.[4] A47L 5/30**
**U.S. Cl. 15—319** **12 Claims**



1. In a vacuum cleaner of the type having a motor-fan carriage and having a powered brush within a vacuum nozzle which is mounted on but removable from the fan motor carrier, said brush being driven by the fan motor while the cleaner is in a brush-and-vacuum mode, said driving being through a drive linkage which includes a torque-limiting slip connection, said cleaner having clutch means in the drive linkage to disconnect the drive to the brush of the attached nozzle during operation of the fan motor in modes other than the brush-and-vacuum mode and to connect the drive to the brush in such less-named mode, the improvement wherein said clutch means comprises a positive drive clutch in said drive linkage between the fan motor and said torque-limiting slip connection, and said vacuum cleaner includes control means active at the inception of each operation of said cleaner in said brush-and-vacuum mode to engage the clutch prior to starting the fan motor and active at the conclusion of operation of said cleaner in said brush-and-vacuum mode to disengage the clutch only after stopping the fan motor.

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**4,610,048**

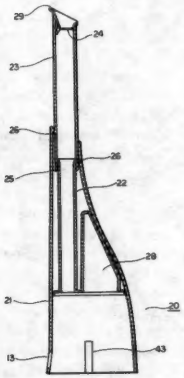
## HAND HELD VACUUM CLEANER

**Naoki Ishihara, Flat 209, Viking Villas, No. 70, Tin Haw Temple Road, and Choy K. Kuen, No. 1, Ching Ling, Gerr. 1st Floor, Flat D, both of Hong Kong, Hong Kong**

**Continuation of Ser. No. 522,117, Aug. 11, 1983, abandoned.**
**This application Jul. 25, 1985, Ser. No. 758,839**
**Int. Cl.[4] A47L 5/24**
**U.S. Cl. 15—344** **19 Claims**

1. In a hand held vacuum cleaner comprising a first unit locked by lockin means to a second unit, said first unit comprising an outer housing, a dust inlet means, and contained within said housing a space for holding collected dust, said second unit comprising motor means, fan means, venturi means, and handle means; the improvement comprising, in combination

said dust inlet means consisting of an extendible second telescoping cylinder having a first end and a second end and slidably fit about a first cylinder having a first end and a second end, said first cylinder being fixedly attached at said second end to and being completely within said outer housing of said first unit, with said first and second cylinders being separate from said outer housing, and mean for sealing said first and second cylinders against dust escaping from inside of said first and second cylinders, wherein said mean for sealing comprises a first seal disposed at the second end of said second cylinder and in contact with said first cylinder, a second seal disposed at the first end of said first cylinder and in contact with said second cylinder, and a third seal comprising means for fixedly attaching said second end of said first cylinder to said outer housing, said second cylinder being extendible outside of said outer housing and movably disposed with respect to said outer housing and having an opening in said first end and contained within said outer housing during non-use and extending outside of said housing for collecting dust, and said first cylinder having an opening at said second




end opposite to said opening at said first end of said second cylinder for exiting of said dust into said space;

said space in said first unit being sealed by said third seal against dust leaking into contact with outside of said first and second cylinders;

said second unit further comprising a filter unit disposed within said space of said first unit when said first and second units are interlocked;

said locking means comprising a resilient button means disposed in an area at a top part of said second unit interconnected with and in contact with said first unit, a hole within a top part of said first unit at a position whereat said first and second units are interconnected, and at least a pair of protrusions disposed on two sides of said second unit, and a pair of corresponding channel means disposed on two sides of said first unit, whereby in an interlocking position, said protrusions and said channels are fitted together and said button is in said hole;

flexible means for opening and closing said opening at said first end of said second cylinder; and

means for preventing said second cylinder from being completely removed from said first cylinder comprising protrusions about said second cylinder of dimensions greater than said dust inlet means.

4,610,049

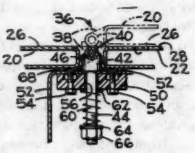
## AIRCRAFT BELT LOADER HINGE ASSEMBLY HAVING A SPRING LOADED SHOCK ABSORBING HINGE SUPPORT

William C. Dean, Orange City, Fla., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 586,522, Mar. 5, 1984, abandoned. This application Sep. 24, 1985, Ser. No. 778,778

Int. Cl.[4] E05F *1/12*

U.S. Cl. 16—286 7 Claims




1. In operating equipment having a support means, a removable cover, and an adjacent plate, said cover and plate having upper surfaces together defining a substantially coplanar work surface on said equipment;

the improvement therein to enhance utilization of said work surface as well as ready access to portions of said operating equipment beneath said removable cover, comprising:

a pivoting hinge assembly disposed between said removable cover and said plate to permit hinging movement of said cover toward said plate, said hinge assembly including a pair of hinge ears rigidly affixed to said cover between said cover and said plate and below the level of said work surface, and, pivot pin means cooperatively associated with said ears to permit relative pivotal motion therebetween through an arc of substantially 180°;

an elongated guide rod connected to said pivot pin means;

said support means including a separate apertured block secured to the bottom of a support member receiving said guide rod for reciprocable movement substantially perpendicular to said work surface and extending away therefrom on the opposite side thereof through said block thereby to provide no obstruction to said work surface;

spring means interposed between said rod and said block and engaging said rod and said block for retaining said rod connected to said block and normally urging said rod in a direction away from said work surface,

said guide rod having a length sufficient to permit said pivot pin means to extend and project from its initial position completely below the work surface to another position entirely above said work surface upon axial movement of said guide rod toward said work surface on compression of said spring means,

a gasket being provided between the top of the support member and the bottom of the removable cover and the plate to dampen vibrations,

whereby upon pivotal hinging movement of said cover toward said plate, said cover swings freely about said hinge assembly until contact of said cover with said plate above the level of the hinge assembly to form a fulcrum thereat whereupon said guide rod is drawn upwardly against the force of said spring means to elevate the hinge assembly above said work surface as said hinged cover moves through substantially 180° into overlying relationship on said plate, thereby fully supporting said cover on said plate while providing open access to the operating equipment area normally beneath said cover.

4,610,050

## DEVICE FOR DRAWING THE CROP AND GULLET FROM SLAUGHTERED POULTRY

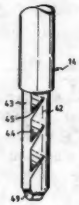
Rudolf J. Tieleman, Doesburg, and Ritsaert L. J. M. Ruesen, Doetinchem, both of Netherlands, assignors to Linco Holland Engineering B.V., Doesburg, Netherlands

Filed Jun. 7, 1985, Ser. No. 742,176

Claims priority, application European Pat. Off., Oct. 22, 1984, 84201518.2

Int. Cl.[4] A22C *21/06*

U.S. Cl. 17—11 11 Claims




1. A device for drawing the crop and gullet from slaughtered poultry, provided with a bore tube, having loosening and entrailing means at its free end, and which is introduced into the bird's truck via an opening between the breast-bone and the tail of the bird, characterized in that two diametrically opposed strips each have one end which is secured at the free end of the bore tube (**14**), said strips extending parallely to the center line of the tube, said strips along two opposed edges being provided with teeth (**44**) which are directed obliquely and toward the other end of the strip (**42, 43**).

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4,610,051

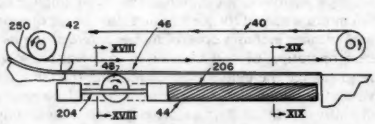
## TURKEY THIGH SKINNER

Eugene G. Martin, New Holland, and Michael E. Lease, Lancaster, both of Pa., assignors to Favorite Manufacturing, Inc., New Holland, Pa.

Filed Jul. 24, 1985, Ser. No. 758,492

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—11 34 Claims




1. A skinner apparatus for removing the skin from the meat of a poultry part, said apparatus comprising:

a frame;

a loading spike having a free end and a fixed end secured to said frame;

a conveyor supported on said frame in spaced, juxtaposed relationship to said loading spike for conveying the poultry part along said spike;

cutting means on said frame below said loading spike for cutting the skin of a poultry part on said spike; and

skinning means on said frame, positioned below and extending adjacent said loading spike for engaging the skin and pulling the skin from said poultry part.

4,610,052

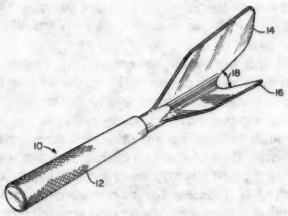
## SHELLFISH OPENING TOOL

Kip C. Lubcke, 277 Gemini Dr., 4C, Somerville, N.J. 08876

Continuation-in-part of Ser. No. 733,889, May 14, 1985, abandoned. This application Jun. 3, 1985, Ser. No. 740,385

Int. Cl.[4] A22C 29/04

U.S. Cl. 17—75 6 Claims




1. A utensil suitable for cutting shellfish or the like which comprises a handle, a first substantially planar knife portion extending from said handle, and a second substantially planar knife portion extending from said handle; said first and second planar knife portions being joined so as to form an angle at a common edge and having a slit partially through said edge and said second planar knife portion having a cutting edge located on its side immediately adjacent said slit.

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4,610,053

## DEVICE FOR SEALING COIN CONTAINING BAG OR THE LIKE

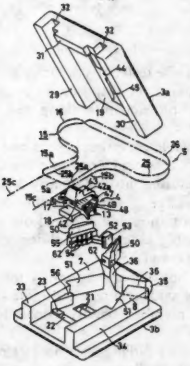
Sumio Tomita, 1-15, 3-chome, Higashitoyonaka-cho, Toyonaka-shi, Japan

Filed May 23, 1984, Ser. No. 613,124

Claims priority, application Japan, May 23, 1983, 58-91349; Jun. 15, 1983, 58-108367; Aug. 12, 1983, 58-148379; Dec. 29, 1983, 58-246607

Int. Cl.[4] B65D 77/10

U.S. Cl. 24—30.5 R 5 Claims



1. A device for sealing a coin containing bag or the like article comprising:

(a) a case having front, rear, upper, lower, right and left side walls defining a hollow portion in said case,

(b) a string holder block member disposed in said hollow portion for movement toward the front portion of said case along right and left tapered walls thereof,

(c) a string of required length to enclose the bag having a midportion and two free ends,

(d) portions of said left and right side walls tapering toward the front of the case adjacent said string holder block member,

(e) a support surface on said block member defining a string holder for engagement with said string,

(f) a midportion of said string in engagement with said support surface,

(g) a first portion of said string extending from the midportion through said hollow portion outward from the front of the case to form a first loop to enclose the article and thence bask into the hollow portion of said case through the lower front portion thereof and being positioned between a side wall of the case and said block member with its free end extending outward from the rear end of said case,

(h) a second portion of said string extending from the midportion through said hollow portion outward from the front of the case to form a second loop to enclose the article and thence back into the holow portion through the lower front portion thereof and being positioned between a side wall of the case and said block member with its free end extending outward from the rear end of said case, whereby pulling the free ends of said string decreases the size of said first and second loops and tightly encloses the article,

(i) means to secure said first and second portions of its string and midportion to the string holder block member after the free ends of the string have been pulled tight to seal said articles and

(j) said string holder block member including a detent projection facing the lower wall of said case, and at least one engaging cavity for the detent projection to fit in formed in the lower wall of said case.

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4,610,054

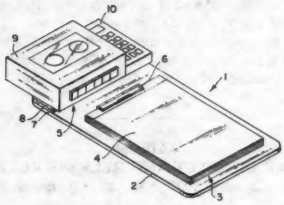
## CLIPBOARD WITH RELEASABLE FASTENING MEANS FOR ATTACHMENT OF ACCESSORIES

Thomas Malian, 1 Willets Rd., Old Westbury, N.Y. 11568

Filed May 28, 1985, Ser. No. 738,221

Int. Cl.[4] B42F 9/00; A47G 29/00

U.S. Cl. 24—67 R 1 Claim




1. A clipboard assembly comprising: a generally rectangular board having a generally planar front surface divided into two regions, a first region dimensioned to accommodate a writing tablet and a second region disposed above said first region dimensioned to accommodate an accessory, said first region being at least twice as large as said second region;

a clip secured to said board and disposed between said first region and said second region adjacent to said first region for releasably clamping a writing tablet to said first region;

at least two accessories; and

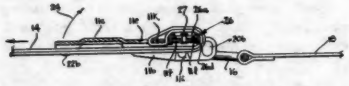
means for releasably fastening said accessories, in the form of electrical components such as electrical calculator and recorder, to said second region including a pair of cooperating hook and loop tape fastening elements, said loop fastening element being affixed to said second region and said hook fastening element being affixed to said accessory so that the operator's hands can be free to take notes without manipulating said electrical components.

4,610,055

## BUCKLE TIEDOWN ASSEMBLY

Howard T. Knox, Simi, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 624,409, Jun. 25, 1984. This application Aug. 23, 1985, Ser. No. 768,675
Int. Cl.[4] A44B *11/12, 21/00*
U.S. Cl. 24—68 CD 4 Claims



1. A buckle assembly for tightening and securing a pair of straps or the like around a load to be retained in place comprising:

a frame member having a generally elongated flat central piece and a pair of opposing legs which extend normally from opposite edges of said central piece, said legs having oppositely positioned apertures formed therein towards one end thereof and detents or protrusions extending outwardly from said legs at a position therealong between said apertures and said one end thereof, first and second cross arms running between said legs, there being a first slot formed between said first and second cross arms and a second slot formed between said first cross arms and said central piece,

a resilient generally U-shaped bale member having turned in end portions, said end portions being fitting into the apertures of the frame legs to pivotally support the bale member thereon,

a clamping member, and

means for slidably mounting said clamping member on said first cross arm,

one of said straps being fixedly retained on the bale member, the other of said straps being reeved through the slots of the central piece of the frame member and wrapped around the clamping member for adjustment relative thereto, said clamping member being slidably drawn to clamp the other of said straps against the second cross arm when the other of said straps is tensioned,

the frame member being movable between a "tension" position with the bale on one side of said detents and a "release" position with the bale on the other side of said detents.

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4,610,056

## QUICK CONNECT AND RELEASE BUCKLE

Raymond L. Emmert, 8028 NW. 20, Oklahoma City, Okla. 73127

Filed Nov. 5, 1984, Ser. No. 668,531
Int. Cl.[4] A44B *11/12*
U.S. Cl. 24—197 4 Claims

1. A quick connect and release buckle, comprising:

two parts formed from planar material, one said part having a planar end portion;

means for attaching a belt to each part;

a tongue at the other end portion of said one part arcuately curved back upon itself and forming an arcuate end wall defining a part-cylindrical recess, open at both sides of the tongue, and a slot-like opening adjacent said planar end portion and terminating in a planar tip, medially the width of the tongue, having arcuate side surfaces merging into an arcuate end surface with the plane of the tip inclined on an acute angle with respect to the plane of said planar end portion; and,

a transverse planar latch bar disposed at one side of a buckle tongue receiving opening in one end portion of the other said part,

said latch bar being adapted for entering the part-cylindrical recess through the slot-like opening when the plane of the latch bar is disposed substantially parallel with the plane of said planar end portion,

said latch bar being cooperatively nested by the part-cylindrical recess with the plane of the latch bar normally inclined with respect to the plane of said tip when said two parts are operably engaged,

said latch bar having a transverse cross section dimension greater than the transverse dimension of the slot-like opening and slightly less than the diameter of the part-cylindrical recess for normally preventing buckle releasing movement of one part toward or away from the other part when said two parts are operably engaged.

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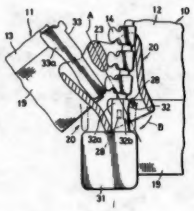
4,610,057

## SEPARABLE SLIDE FASTENER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,848
Claims priority, application Japan, Dec. 13, 1983, 58-191771[U]
Int. Cl.[4] A44B *19/00*
U.S. Cl. 24—433 3 Claims



1. A separable slide fastener comprising:

(a) a pair of oppositely disposed stringers each carrying a row of coupling elements along one longitudinal edge portion thereof;

(b) a slider movable reciprocably on and along said pair of stringers to couple and uncouple the coupling elements, said slider including a substantially Y-shaped guide channel for the passage of said rows of coupling elements and a locking prong movable into and out of said guide channel for releasably locking said slider on said rows of coupling elements; and

(c) a separable bottom end assembly mounted on adjacent lower ends of said stringers and including;

(1) a socket member fixedly connected to one of said stringers;

(2) a first separate pin member projecting from said socket member and fixedly connected to said one stringer, said first separate pin member being receivable in said guide channel of said slider;

(3) a second separate pin member fixedly connected to the other of said stringers in opposite relation to said socket member and said first separate pin member and receivable in said guide channel and said socket member, said second pin member having a substantially planar outer surface extending substantially parallel to the general plane of said slide fastener; and

(4) said first pin member having a first outer flat surface disposed adjacent to said second pin member and ex-

tending substantially flush with said planar outer surface of said second pin member, and a second outer beveled cam surface contiguous to said first flat outer surface and extending away from said second pin member downwardly toward the plane of said one stringer, said second outer beveled cam surface being engageable with said locking prong to cause the latter to move upwardly along said beveled cam surface into engagement with said first outer flat surface, in response to threading movement of said second pin member into said guide channel of said slider and said socket member while said slider is at rest on said socket member.

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**4,610,058**

## CENTRAL LOCK FOR SAFETY BELTS

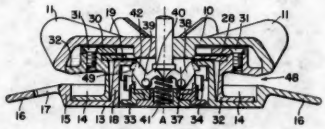
**Hans-Joachim Stemmildt, and Hubert Nöhren, both of Hamburg, Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany**

**Filed May 17, 1985, Ser. No. 735,383**

**Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418265; Feb. 23, 1985, 3506454**

**Int. Cl.[4] A44B *11/25***

**U.S. Cl. 24—574** **16 Claims**




1. A central lock for safety belts, especially for use in aircraft and sports cars, for the rapid and at the same time releasable connection of several belts which are provided with connection members and which come together at a central point; the lock having therewith an external bead behind which the connection members can catch, which in the process can freely align themselves in the respective belt-pulling direction; the lock also having therewith control elements for fastening the connection members, for holding them securely in place, and for releasing them, with these control elements being operatively coupled exclusively with a manually operable rotary member, rotation of which effects actuation of said central lock for safety belts and which is disposed over a central stud in conjunction with which the various movements in the lock occur to bring about three important operating positions including "fasten", "secured", and "release" respectively responsive to a pivot movement of a pivotable lever perpendicular to a base plane with which especially the position "release" brings about simultaneous ejection of all connection members by actuation of said rotary member; the improvement therewith which comprises:

a retention and release element disposed around said central stud, with said element having a part which extends parallel to the central longitudinal axis of said lock; said central stud having two ends, each of which is essentially disposed in a respective plane which extends perpendicular to said central longitudinal axis; said control elements, for assuming the important operating positions of said lock, being disposed about said central longitudinal axis in the vicinity of an annular space defined by said planes of said ends of said central stud, and by said part of said retention and release element.

**4,610,059**

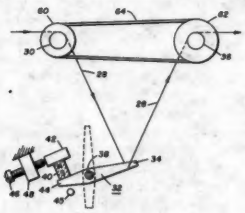
## WARP MONITORING AND BEAMING PROCESS

**Douglas K. Seaborn, Cantonment, and William T. Dowell, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Dec. 4, 1984, Ser. No. 678,130**

**Int. Cl.[4] D02H *13/08***

**U.S. Cl. 28—187** **8 Claims**




1. In a warping process wherein a plurality of individual yarns are withdrawn from a like plurality of bobbins, passed through an accumulator and wound on a beam as a weftless warp sheet, said accumulator comprising means for continuously storing a quantity of each of said yarns, means for detecting the tension in each of said yarns, and means for stopping the process upon occurence of tension in any given one of said yarns equal to a given level, the improvement comprising:

a. passing each of said yarns sequentially

(1) in a partial wrap around the peripheral surface of a common inlet roll upon entry to said accumulator,

(2) in a partial wrap around a corresponding individual tension detector, and

(3) in a partial wrap around the peripheral surface of a common outlet roll upon leaving said accumulator, and

b. driving said inlet roll at a faster peripheral speed than the peripheral speed of said outlet roll,

c. the speeds of said rolls and the coefficients of static friction between said yarns and the peripheral surfaces of said rolls being selected such that each of said yarns is normally subjected to lower tension just prior to contacting its said corresponding individual tension detector than just prior to contacting said inlet roll.

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**4,610,060**

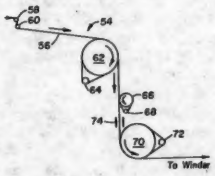
## DRAFTING SYSTEM FOR YARNS

**Bobby M. Phillips, Kingsport, Tenn., and Bobby D. Duncan, Abingdon, Va., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation-in-part of Ser. No. 644,299, Aug. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 533,040, Sep. 16, 1983, abandoned. This application Nov. 21, 1985, Ser. No. 800,255**

**Int. Cl.[4] D02J *1/22***

**U.S. Cl. 28—246** **15 Claims**




1. A drafting system for yarn comprising: driven feed means for feeding said yarn at a predetermined speed; driven output means for forwarding said yarn at a second predetermined speed greater than said first-mentioned predetermined speed; a

low friction freely rotatable heated roll, the surface of which is heated to a predetermined temperature, said freely rotatable heated roll being located between said driven feed means and said driven output means; and a separator roll spaced adjacent to said freely rotatable heated roll and wherein said yarn is wrapped a plurality of times around said freely rotatable heated roll and said separator roll; and the surface speed of said freely rotatable heated roll is operating slightly faster than the surface speed of said driven input means, with said freely rotatable heated roll being driven by engagement with said yarn and whereby sufficient yarn tension automatically is transferred upstream of said freely rotatable heated roll to pretension said yarn before it contacts said freely rotatable heated roll with drafting taking place near the location where said yarn leaves said freely rotatable heated roll to pass toward said driven output means, and wherein:

(a) the steady state resistance to turning of the freely rotatable heated roll plus separator roll, as measured by stress on the yarn being drafted, is no more than 0.25 grams/-denier (drafted yarn),

(b) the start-up resistance, which is primarily the inertia of the freely rotatable roll, is

$$\text{no more than } \frac{0.000113 \text{ pounds} \times \text{square foot}}{\text{denier(drafted yarn)}} \text{ or}$$

$$\frac{4.86 \times 10^{-5} \text{ newtons} \times \text{meters squared}}{\text{denier(drafted yarn)}} \text{ as obtained from}$$

$$\text{the equation } T = \frac{CWk^2\alpha}{\text{denier(drafted yarn)}}$$

wherein

T=torque (length×force)/per unit denier

C=constant depending on units selected

k=radius of gyration (units of length)

α=angular acceleration (radians per second squared)

W=weight (units of mass),

(c) the coefficient of friction, between the yarn and the surface of the freely rotatable heated roll as measured on a Rothschild Friction Tester (based on capstan equation) using 180° contact at a yarn speed of 10 meters/minute, is greater than 0.57,

(d) the separator roll being located at a position relative to the freely rotatable heated roll and relative to the direction of the path of yarn movement such that the angle of contact of the yarn with the surface of the freely rotatable heated roll is ≧30° on the first wrap and is ≧30° on the last wrap before the yarn leaves the freely rotatable heated roll, and

(e) there is no frictional contact made with the yarn in the area where pretension occurs between the location where the yarn exits from the driven feed means and the location where the yarn makes initial contact with the freely rotatable heated roll.

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**4,610,061**

## LOW VELOCITY EXPANDING PROJECTILE

**Henry J. Halverson, Collinsville, Ill., assignor to Olin Corporation, Stamford, Conn.**

**Continuation of Ser. No. 545,596, Oct. 26, 1983, abandoned, which is a division of Ser. No. 280,769, Jul. 6, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,386**

**Int. Cl.[4] B21K *21/06*; F42B *11/10***

**U.S. Cl. 29—1.23** **1 Claim**

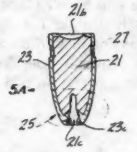
1. A method of uniformly notching an upsetting non-fragmenting jacketed hollow point projectile for pistol ammunition which method comprises the steps of:

(a) inserting a lead core forwardly into a rearwardly opening cuplike aluminum jacket to form a jacketed core having a longitudinal axis;

(b) forming said jacketed core into a projectile preform having the base of said jacket cup facing forward and forming a flat circular frontal area on said projectile preform the frontal area being orthogonal to the longitudial axis;

(c) simultaneously with said preforming step, uniformly notching but not splitting said flat front of said preform while leaving the ogive of said preform unnotched;

(d) axially recessing the nose of said jacketed preform to produce a hollow point cavity; and




(c) forming said notched preform into a final projectile by reducing the flat front of said notched preform so that said notches extend from the ogive, pass over an annular nose rim of said projectile and terminate in said cavity, whereby to produce a bullet which uniformly upsets without fragmentation upon target impact.

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**4,610,062**

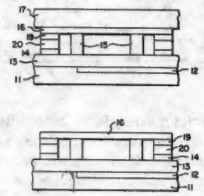
## METHOD OF MAKING AN ACOUSTIC MICROPHONE

**Jon A. Roberts, Minnetonka, and Thomas E. Hendrickson, Wayzata, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Division of Ser. No. 446,290, Dec. 2, 1982, Pat. No. 4,495,385. This application Sep. 6, 1984, Ser. No. 647,957**

**Int. Cl.[4] H01G *7/00***

**U.S. Cl. 29—25.41** **10 Claims**




1. A method for fabricating a capacitive acoustic transducer comprising:

forming a first field plate on a substrate structure;

forming a second field plate on a disposable support structure;

providing first and second contact means for respective connection to said first and second field plates;

mounting said second field plate and disposable support structure to said substrate structure so that said first and second field plates form an acoustically responsive capacitor; and,

disposing of said disposable support structure.

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**4,610,063**

## METHOD FOR FABRICATING A WATERING SYSTEM FOR FOWL

**Frederick W. Steudler, Jr, Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.**

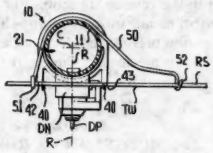
**Division of Ser. No. 569,761, Jan. 10, 1984, Pat. No. 4,543,912. This application Apr. 3, 1985, Ser. No. 719,502**

**Int. Cl.[4] B21D *53/00***

**U.S. Cl. 29—157 R** **7 Claims**

1. A method of fabricating a fluid flow orientation system comprising the steps of providing a pipe having a through opening and opposite ends and a coupling with at least one exterior uniplanar locating surface, forming at least one opening in the pipe, establishing a reference line passing through the one opening and the axis of the through opening, orienting the

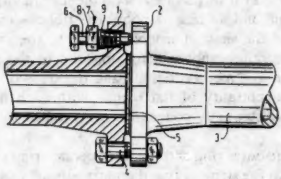
pipe and coupling to position the uniplanar locating surface in a plane at a desired angle to the reference line, and securing the coupling to the pipe to maintain the oriented relationship of the pipe and coupling and thereby also maintaining oriented the one opening reference line and the through opening axis.




## 4,610,064
## DEVICE FOR SPREADING FLANGES

**Paul F. M. Verstraeten, Terneuzen, Netherlands, assignor to 501 Peinemann Equipment B.V., Netherlands**

**Filed Mar. 20, 1985, Ser. No. 713,892**
**Claims priority, application Netherlands, Mar. 21, 1984, 8400898**
**Int. Cl.⁴ B23P *19/04***
**U.S. Cl. 29—239** **10 Claims**



1. A device for spreading two flanges mounted in facing relation in a pipe system to allow temporary separation of the flanges for removal and replacement of a gasket between them, each flange having a plurality of holes adapted to receive fastening elements to hold the flanges in sandwiching relation to an intervening gasket, said device comprising a pressure element presenting a body having a conical threaded portion terminating at its large end in a non-circular head with the opposite, smaller end being of a diameter less than the diameter of said holes and the larger end of the conical body being of a diameter larger than the diameter of said holes, said body being threaded from its smaller end to its larger end and there being at least three separate threads each having a flattened top so that the threads may engage within a hole without cutting into the flange, said separate threads being distributed at equal angular distances around the circumference of said body so that when the body is seated within a hole, the tops of the threads seat therewithin in equally spaced circumferential relation in a plane perpendicular to the axis of the hole, and pressure means passing axially through said body for exerting axial pressure to separate said flanges.

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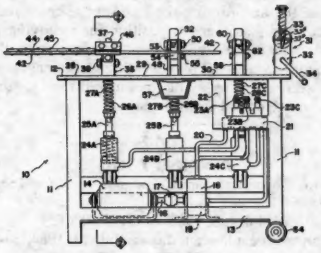
## 4,610,065
## SICKLE KNIFE REPLACEMENT ASSEMBLY

**John Froh, Box 142, Khedive, Saskatchewan, Canada S0C 1K0**

**Filed Jan. 28, 1986, Ser. No. 823,380**
**Claims priority, application Canada, Feb. 5, 1985, 473,637**
**Int. Cl.⁴ B23P *11/00***
**U.S. Cl. 29—243.53** **20 Claims**

1. An assembly for removing and replacing sickle knives on a knife bar comprising in combination a supporting frame, first means on said frame to shear the rivets securing individual knives to said knife bar and to remove the knife therefrom, second means on said frame to punch out the rivet shanks from said knife bar remaining after said knife has been sheared therefrom, and third means on said frame to rivet new knives in position upon said frame, said first, second and third means operating successively upon individual knives being replaced,



means to operate selectively, said first, second and third means and further means on said frame to position said knife bar successively relative to said first, second and third means.

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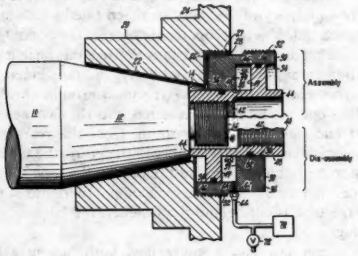
## 4,610,066
## APPARATUS FOR MOUNTING AND REMOVING A HUB FROM A SHAFT

**William F. Cline, Rector, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.**

**Filed May 16, 1984, Ser. No. 610,735**
**Int. Cl.⁴ B23P *19/04***
**U.S. Cl. 29—252** **2 Claims**



1. An assembly for mounting and removing a hub from a shaft which serially includes a tapered portion, a radially-extending abutment face and a threaded end portion, said hub including a tapered portion which is complementary to the shaft tapered portion, a radially-extending abutment face and an axially-extending threaded portion, said assembly comprising

an annular cylinder having a threaded portion for engaging the threaded end portion of the shaft when positioned for mounting the hub to the shaft, a contact face positioned to engage the shaft abutment face when the cylinder is positioned for removing the hub from the shaft, a first cylinder sliding surface and a second cylinder sliding surface, said cylinder defining an axially extending center opening wherein the cylinder threaded portion extends inwardly from the cylinder towards the center opening and wherein the first and second cylinder sliding surfaces are annular and are positioned radially outwardly from the center opening and extend in an axial direction; and

an annular piston having a first piston sliding surface and the second piston sliding surface each mating with the respective cylinder sliding surface to define a cavity between the piston and cylinder threaded portion on the piston for engaging the threaded portion of the hub when the piston is in position for removing the hub from the shaft, a cylinder contact face for engaging the abutment face of the shaft when the cylinder is in position for mounting the hub on the shaft, said piston defining a

conduit for supplying pressurized fluid to the cavity, whereby if pressurized fluid is supplied to the cavity when the cylinder and piston are in position for mounting the hub to the shaft, the cylinder is threadably secured to the shaft threaded end portion, and then the piston engages the hub forcing the hub on the shaft and, if the cylinder and piston are in position for removing the hub from the shaft, the cylinder contact face abuts the shaft abutment face and the piston is threadably engaged to the hub such that by supplying pressurized fluid to the cavity the hub is removed from the shaft.

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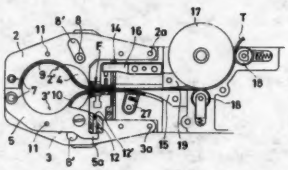
**4,610,067**

## BINDING TOOL

**Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Yokohama, Japan**

**Filed Jul. 8, 1985, Ser. No. 752,699**
**Claims priority, application Japan, Jul. 10, 1984, 59-141453**
**Int. Cl.[4] B21F *9/02***
**U.S. Cl. 29—33.5** **1 Claim**



1. A binding tool of the type in which a fastener row consisting of a plurality of fasteners arranged side by side at a predetermined pitch is fed by increments corresponding to said pitch, a binding tape is fed into the leading fastener in a set position from behind in a tool body, the tape emerging from the front end of the fastener is passed around an object, the leading end of the tape is inserted into the fastener from the front end, the tape end emerging from the rear end of the fastener is clamped by a stopper in the body, the tape is pulled back to be tightened around the object, the tape is secured to the fastener by driving an associated pin thereinto in the body, and the tape is cut behind the fastener, the binding tool comprising:

an upper jaw and a lower jaw, both having a thickness smaller than the width of the tape, said jaws being pivotally coupled to the body at the position where the tape emerges from the front end of the fastener at the front end of the body and being arranged to form a space between them when they are closed on each other, paired side plates provided in a spring-biased relation on the opposite sides of each of said jaws so as to open and close in unison with the jaws, the paired side plates being rotatable about the front end of the jaws, holding means provided between each jaw and each of the associated side plates for holding the side plates in a tape-guiding relation with respect to the associated jaws and for releasing the side plates when the side plates are separated from the corresponding side surfaces of the jaws against biasing force, the side plates defining an enclosed space when they are closed which is smaller than the space defined by the jaws in the closed state thereof and has a narrowed portion at the position where the tape emerges from the body, grooves formed in the opposed surfaces of the paired side plates for guiding the edges of the tape, said grooves having inclined surfaces against which the edges of the tape ride to separate the side plates from the corresponding side surfaces of the jaws for escaping into the enclosed space, drive means for opening and closing said jaws, urging means having springs in contact with the side plates for pushing the side plates of the upper jaw upwardly and the side plates of the lower jaw downwardly when the jaws are closed, tape reciprocation means rotatable by a predetermined fixed amount in one direction to feed out the tape and slippedly rotatable by the same amount in the reverse direction to pull back the tape, and slip control means for controlling the slipping of said tape reciprocation means, said drive means, urging means, tape reciprocation means and slip control means being housed in said tool body.

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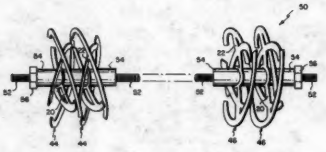
**4,610,068**

## METHOD FOR FORMING A RIBBON BLENDER

**Peter G. Schultz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 17, 1985, Ser. No. 755,879**
**Int. Cl.[4] B23P *17/00*; B01F *7/00***
**U.S. Cl. 29—418** **4 Claims**



1. A method for forming a ribbon blender having a shaft, an outer ribbon, and an inner ribbon, the ribbons extending spirally around the shaft in spaced relation to the shaft with the pitch of the outer ribbon being opposite to the pitch of the inner ribbon, the method comprising the steps of:

forming a plurality of flat blanks with each blank having three substantially concentric rings joined by two spaced strips,

cutting the outer ring and the intermediate ring of each blank between the strips at two diametrically spaced locations to thereby form four ribbon segments from each of the outer two rings with each segment having a free end spaced from the strips,

bending the free ends of each of the ribbon segments away from the plane of the blank with the free ends of adjacent segments of each ring being bent in opposite directions to thereby form a plurality of ribbon blender elements, and

assembling a plurality of the elements on a shaft with the ends of the ribbon segments of the outer rings of adjacent elements forming a substantially continuous ribbon and with the ends of the ribbon segments of the intermediate rings of adjacent elements forming a substantially continuous ribbon.

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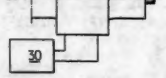
**4,610,069**

## PROCESS FOR FORMING REMOVABLE FLUID TIGHT SEALING CONNECTIONS FOR HIGH PRESSURE DUCTS

**Claudine Darbois, Le Plessis-Robinson, France, assignor to Electricite de France, France**

**Filed Feb. 28, 1985, Ser. No. 706,644**
**Claims priority, application France, Feb. 28, 1984, 84 03059**
**Int. Cl.[4] B23P *17/00*; B21D *39/00*; F16L *13/14***
**U.S. Cl. 29—421 M** **4 Claims**



1. A process for forming a removable connection between a tube and a sleeve ensuring the sealing of high pressure ducts, comprising the steps of:

providing a nut which is internally threaded for connection

with external threads on the sleeve and which has an internal abutment surface,

inserting the nut on the tube,

providing a solid annular shaped part at least partially made from electrically conducting material,

inserting the annular part on the tube,

inserting a removable forming die into the tube,

securing the annular part to the end portion of the tube over the whole length of the annular part by magneto forming, and

screwing the nut on the sleeve for deforming the annular part with the abutment surface and applying the annular part sealingly against an internal face of the sleeve.

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**4,610,070**

## PROCESS FOR MANUFACTURING CLAD STRIPS

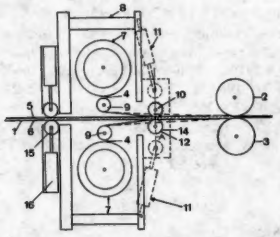
**Ernst Gold, Veyras, Switzerland; Erich Trägner, and Dieter Lenz, both of Singen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Sep. 13, 1984, Ser. No. 650,130**

**Claims priority, application Switzerland, Sep. 20, 1983, 5095/83**

**Int. Cl.⁴ B21D *39/03*; B23P *11/00***

**U.S. Cl. 29—429** **18 Claims**



**1**. Process for manufacturing clad strips which comprises: providing a core strip and a cladding strip; forming a composite by rolling together said core and cladding between cladding rolls; attaching the cladding strip to the core strip by mechanical deformation by attachment rolls upstream of said cladding rolls; and introducing said attached material into a roll gap formed by at least two of said cladding rolls to roll and deform the attached material and form a clad strip, wherein the attachment process is at most carried out until the attached material is engaged by the roll gap of the cladding rolls and withdrawing the attachment rolls after the attached material is engaged by said roll gap.

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**4,610,071**

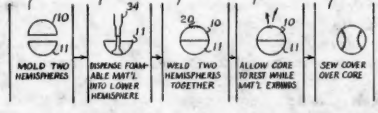
## METHOD OF FORMING FOAM FILLED BASEBALL OR SOFTBALL

**Richard E. Miller, 6119 Cowan Mill Rd., Douglasville, Ga. 30135**

**Continuation-in-part of Ser. No. 441,566, Nov. 15, 1982, Pat. No. 4,568,083. This application Mar. 25, 1985, Ser. No. 715,387**

**Int. Cl.⁴ B23P *25/00***

**U.S. Cl. 29—458** **6 Claims**


MOLD TWO HEMISPHERES
DISPENSE FOAMABLE MAT'L INTO LOWER HEMISPHERE
WELD TWO HEMISPHERES TOGETHER
ALLOW CORE TO REST WHILE MAT'L EXPANDS
SEW COVER OVER CORE

**1**. A method for making a game ball for playing a game of baseball or softball, said ball including a ball core, and a cover of leather or the like covering said ball core, the completed ball having a first diameter equal to a standard diameter in the game, said core having a second diameter equal to said first diameter less the thickness of said cover, and wherein said ball has a coefficient of restitution substantially at the coefficient of restitution set for the game, said ball has a sound when hit acceptable for the game, said ball has a weight within the standards set for the game, and said ball has a feel off the bat acceptable for the game, said method comprising the steps of molding an upper hemisphere having a diameter equal to said second diameter, said upper hemisphere being hollow and having a wall thickness, and defining a plurality of vent holes through said wall thickness generally at the apex, molding a lower hemisphere having a diameter equal to said second diameter, said lower hemisphere being hollow and having a wall thickness equal to said wall thickness of said upper hemisphere, depositing a quantity of material for forming an expanded plastic into said lower hemisphere, welding said upper hemisphere to said lower hemisphere, allowing the welded hemispheres to rest during expansion of said quantity of material, and covering the welded hemispheres with said cover.

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**4,610,072**

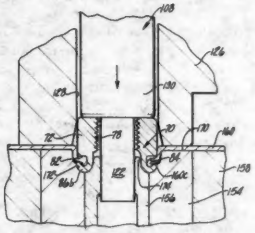
## METHOD OF INSTALLING A FASTENER TO A PANEL

**Rudolph R. M. Müller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 504,074, is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Oct. 4, 1984, Ser. No. 657,570**

**Int. Cl.⁴ B21D *39/00*; B23P *11/00***

**U.S. Cl. 29—512** **15 Claims**



**10**. A method of attaching a female element to a plastically deformable panel, said female element including a body portion and an annular plastically deformable barrel portion extending from said body portion having a free open end, said body portion having a bore extending therethrough coaxially aligned and communicating with the opening through said annular barrel portion, said method comprising the following steps performed in a continuous operation:

(a) locating said female element adjacent a panel with said barrel portion free end facing said panel;

(b) piercing a slug from said panel and forming a pierced panel opening coaxially aligned with said female element body portion bore and barrel portion opening;

(c) driving said female element barrel portion through said pierced panel opening;

(d) plastically deforming the panel portion adjacent said pierced panel opening against said free end and the exterior surface of said annular barrel portion, drawing a tubular panel portion from the plane of said panel into said annular die cavity;

(e) deforming said female element barrel portion free end radially outwardly; and

(f) deforming said female element barrel portion free end toward said body portion into a U-shaped annular channel

opening toward said body portion, simultaneously driving said panel portion into the developing U-shaped barrel portion channel, plastically deforming said panel portion in said U-shaped channel and increasing the thickness of an end of said drawn panel portion and deforming said barrel portion free end against said enlarged panel portion forming a secure mechanical interlock between said panel and said female element.

12. A method of attaching a self-fastening element to a generally planar plastically deformable panel in a die member, said self-fastening element having a body portion and an integral annular barrel portion having a free open end portion, said body portion hving a side surface and a bottom surface and said annular barrel portion integrally joined to said body portion bottom surface spaced inwardly from said side surface, said die member having an annular die cavity including an arcuate concave annular die cavity surface and a central projecting die portion telescopically and closely receivable in said self-fastening element annular barrel portion, said panel including a generally circular opening having an internal diameter less than the external diameter of said self-fastening annular barrel portion, the method comprising the following steps performed in a continuous operation:

(a) driving said self-fastening element barrel portion free end against said panel and through said panel opening plastically deforming the panel portion adjacent said panel opening into said annular die cavity and disposing said self-fastening element annular wall around said die member central projecting die portion;

(b) plastically deforming said self-fastening element annular barrel portion free end radially outwardly into a U-shaped channel in cross section opening toward said body portion against said arcuate concave annular die cavity surface; and

(c) simultaneously driving said self-fastening elment body portion bottom surface into said panel adjacent said panel portion, driving said panel portion into the developing U-shaped portion of said barrel portion free end and against the bottom surface of said U-shaped channel plastically deforming and increasing the thickness of said panel portion in said U-shaped channel, and deforming said barrel portion free end against said thickened panel portion forming a secure mechanical interlock between said self-fastening element annular barrel portion free end and said panel portion.

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**4,610,073**

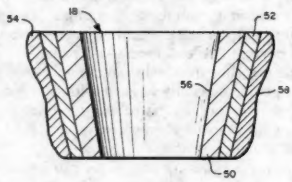
## TRIMETAL PULVERIZER ROLL AND A METHOD OF MANUFACTURE THEREOF

**Theodore V. Maliszewski, North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Division of Ser. No. 446,850, Dec. 6, 1982. This application Jun. 27, 1984, Ser. No. 625,270**

**Int. Cl.[4] B02C *4/30***

**U.S. Cl. 29—527.6** **4 Claims**




1. A method of manufacturing a pulverizer roll having a trimetal form of construction and of the type suitable for use in a bowl mill for purposes of effecting the pulverization therewith of a material such as coal comprising the steps of:

a. centrifugally casting as a unitary element a uniformly thick first portion of a medium wear-resistant material having a substantially circular inner surface and a substantially circular outer surface;

b. applying a bonding agent to the inner surface of the first portion;

c. centrifugally casting as a unitary element a uniformly thick second portion of gray iron embodying a substantially circular outer surface such that the bonding agent is operative for effecting an adherence of the outer surface of the second portion to the inner surface of the first portion and having a through passage formed therein suitably dimensioned so as to be capable of receiving therewithin a member operative for effecting the mounting thereon of the pulverizer roll in supported relation thereto;

d. providing on the outer surface of the first portion a visual indicator of wear; and

e. depositing on the outer surface of the first portion as a weld overlay a third portion of a highly abrasive resistant material having an external surface specifically configured so as to replicate the predicted wear pattern to which the outer surface of the pulverizer roll will be subjected when the pulverizer roll is placed in operation.

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**4,610,074**

## AUTOMATIC TOOL CHANGER OF A MACHINE TOOL

**Hideo Katsube, Hachioji, and Toshiyuki Aso, Koganei, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan**

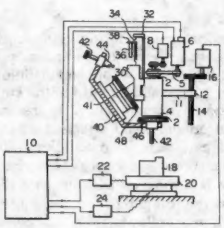
**PCT No. PCT/JP82/00367, § 371 Date May 16, 1983, § 102(e) Date May 16, 1983, PCT Pub. No. WO83/01028, PCT Pub. Date Mar. 31, 1983**

**PCT Filed Sep. 13, 1982, Ser. No. 499,152**

**Claims priority, application Japan, Sep. 14, 1981, 56-145242**

**Int. Cl.[4] B23Q *3/157***

**U.S. Cl. 29—568** **9 Claims**




1. An automatic tool changing device for a machine tool comprising a spindle head movable in an axial direction and rotatably carrying a spindle, a tool magazine having a center axis and a plurality of tools arranged around said center axis and positioned so that an axis of a selected one of said tools can be made coaxial with an axis of said spindle, a first electric motor for rotatably driving said spindle, a second electric motor for axially feeding said spindle head, and control means for controlling said first and second motors, said changing device comprising:

a first gear rigidly mounted on said spindle;

a second gear rigidly mounted coaxially on said tool magazine; and

support means for supporting said tool magazine on said spindle head to allow relative movement between said tool magazine and said spindle head to a first position that will bring said two gears into direct engagement with each other during a tool changing operation or to a second position where said two gears will be disengaged from each other during a machining operation, whereby said tool magazine will be rotated together with said spindle by said first motor for indexing said tool magazine when said two gears are engaged and only said spindle will be

rotated by said first motor when said two gears are disengaged.

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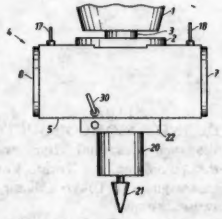
4,610,075

## TOOL HOLDER FOR INDUSTRIAL ROBOTS

Erik Eriksson, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 30, 1984, Ser. No. 677,527
Claims priority, application Sweden, Dec. 1, 1983, 8306630
Int. Cl.[4] B23Q 3/157
U.S. Cl. 29—568 6 Claims



1. A tool holder for operatively connecting working tool attachments to a tool carrier of an industrial robot, each working tool attachment including an elongated supporting arm having a free end and a transverse mounting portion near the free end, the transverse mounting portion extending away from said elongated supporting arm to define a greater width than the width of the elongated supporting arm, the tool holder comprising

a cylindrical housing which is enclosed at its opposite first and second ends,

first and second pistons positioned in said cylindrical housing to be movable between said first and second ends, said first piston facing said first end of said cylindrical housing and said second piston facing said second cylindrical housing, said first and second pistons, when positioned vertically above a said working tool attachment, defining an imaginary horizontal axial plane therethrough,

an elongated connecting member extending between said first and second pistons, said elongated connecting member including first and second axial portions,

said first axial portion including a vertical, axially extending opening therethrough having a first width which is greater than the width of either the transverse mounting portion or the elongated supporting arm portion of a said working tool attachment, such that the transverse mounting portion of a said working tool attachment can be vertically moved therethrough,

said second axial portion defining an upper surface which slants downwardly in the direction of said first axial portion and including a vertical, axially extending opening therethrough having a second width which is greater than the width of the elongated supporting arm of a said working tool attachment but less than the width of the transverse mounting portion thereof, such that the transverse mounting portion of a said working tool attachment can be supported by the upper surface of said second axial portion, and

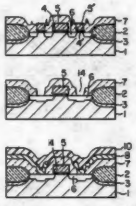
actuation means connected to said cylindrical housing to supply a pressure medium thereto to move said first and second pistons and said connecting member between said first and second ends of said cylindrical housing.

4,610,076

## METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Seiji Ueda, Otsu, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Sep. 28, 1984, Ser. No. 655,672
Claims priority, application Japan, Oct. 3, 1983, 58-185291
Int. Cl.[4] H01L 21/38
U.S. Cl. 29—571 3 Claims



1. A method of manufacturing a field effect transistor of the insulated gate type comprising the steps of

(a) depositing successively a first insulation film and an electrode forming material layer on a semiconductor substrate, said substrate having a given electrical conductivity type;

(b) removing at least first and second portions of said electrode forming material layer and said insulation film from said substrate to form therefrom a gate electrode and another element spaced from said gate electrode by a first exposed portion of said substrate, a second exposed portion of said substrate being located adjacent said another element opposite the side thereof facing said gate electrode;

(c) introducing an impurity into said first and second exposed portions of said substrate thereby forming first and second impurity diffusion regions, said impurity diffusion regions having an electrical conductivity type opposite that of said substrate;

(d) forming a second insulation film over said electrode forming material and the first and second exposed portions of said substrate;

(e) removing said second insulation film from said another element;

(f) removing said another element, including the electrode forming material layer and the first insulation film thereunder forming said another element, to expose a third portion of said substrate; and

(g) introducing an impurity into said exposed third portion of said substrate to form a third diffusion region having an electrical conductivity type opposite that of said substrate, whereby said first, second and third diffusion regions overlap to form a source or drain region of said field effect transistor.

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4,610,077

## PROCESS FOR FABRICATING A WRAPAROUND CONTACT SOLAR CELL

Joseph A. Minahan, Simi Valley; Eugene L. Ralph, San Gabriel, and Hans G. Dill, Newhall, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 30, 1984, Ser. No. 605,319
Int. Cl.[4] H01L 31/18
U.S. Cl. 29—572 7 Claims

1. A process for fabricating a wraparound contact solar cell comprising:

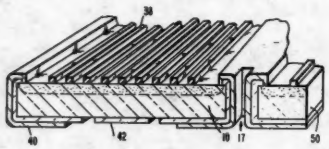
(a) providing a silicon substrate of a chosen size and shape having first and second opposed major surfaces,

(b) forming openings in said substrate and extending through said substrate from said first major surface thereof to said

second major surface and spaced apart by a desired lateral dimension of a solar cell,

(c) processing said substrate to form a p-n junction therein and between said openings, whereby the vertical walls of said substrate defining said openings are exposed for oxidation, photolithography, and junction-forming steps,

(d) utilizing these steps in paragrah (c) above to also form p-region and n-region contacts on the major surfaces of




said substrate and extending to a single one of said first and second major surfaces thereof through said openings where they are electrically isolated for bonding to a common solar cell support member, and

(e) forming grid lines on one major surface of said substrate for interconnection to one of said p- or n-region contacts for deriving a solar cell output voltage resulting from charge carriers generated at said p-n junction.

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**4,610,078**

## METHOD OF MAKING HIGH DENSITY DIELECTRIC ISOLATED GATE MOS TRANSISTOR

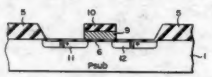
**Naohiro Matsukawa, Kamakura, and Hiroshi Nozawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

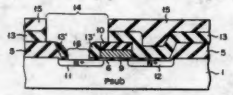
**Filed Dec. 21, 1984, Ser. No. 684,750**

**Claims priority, application Japan, Mar. 16, 1984, 59-50619**

**Int. Cl.[4] H01L** *21/308, 21/265*

**U.S. Cl. 29—576 B** **4 Claims**




1. A method of manufacturing a semiconductor device comprising the steps of:

(a) forming on a top surface of a semiconductor substrate of a first conductivity type an isolation film having a patterned hole, defining an active element region on the substrate, the side walls of said patterned hole being relatively thick;

(b) forming a gate insulating film on said active element region of said substrate;

(c) forming an electrically conductive layer over said top surface of said semiconductor substrate;

(d) forming a first insulating layer on said conductive layer;

(e) patterning said first insulating layer and conductive layer using a reactive ion etching process, thereby forming on said active element region a gate electrode with a first insulation film superposed thereon, the continuous side wall of said gate electrode and first insulation film being relatively thick;

(f) implanting an impurity ion into said semiconductor substrate using said first insulating layer as a mask, thereby forming an impurity diffused region of a second conductivity type in said semiconductor substrate;

(g) forming a second insulating layer over said top surface of said semiconductor substrate;

(h) applying a reactive ion etching process to said second insulating layer, thereby forming a contact hole in said second insulating layer leading to said impurity diffused region, while leaving part of said second insulating layer on said side walls of said isolation film, gate electrode and first insulating layer; and

(i) forming an electrically conductive film in contact with said impurity diffused region.

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**4,610,079**

## METHOD OF DICING A SEMICONDUCTOR WAFER

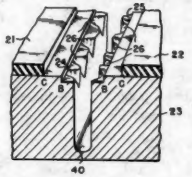
**Masahiro Abe, Yokohama; Masafumi Miyagawa, Sagamihara; Hatsuo Nakamura, Yokohama, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

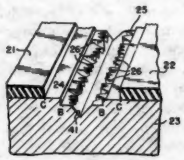
**Continuation of Ser. No. 513,255, Jul. 13, 1983, abandoned, which is a continuation of Ser. No. 223,303, Jan. 8, 1981, abandoned. This application Feb. 26, 1985, Ser. No. 705,844**

**Claims priority, application Japan, Jan. 22, 1980, 55-6079**

**Int. Cl.[4] H01L** *21/304*

**U.S. Cl. 29—583** **3 Claims**




1. A method of preparing a semiconductor wafer for dicing along a predetermined dicing line, comprising the steps of:

forming a groove on a surface of said wafer, said groove straddling said dicing line and substantially preventing the spread of cracks from said dicing line, said groove having a width of substantially 60 μm and a height; and

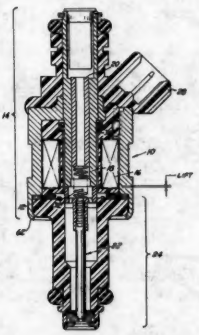
forming a scribe line in said semiconductor wafer along said dicing line, said scribe line being deeper than the height of said groove and less than the thickness of said wafer, said scribe line being narrower than the width of said groove to limit said cracks to propagation substantially within said groove width to allow for dense packing of active element areas on said wafer.

4,610,080

## METHOD FOR CONTROLLING FUEL INJECTOR LIFT

Thomas E. Hensley, Newport News, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 29, 1985, Ser. No. 760,026
Int. Cl.[4] H01F 7/06; B05B 1/30
U.S. Cl. 29—602 R 3 Claims




1. A method for controlling fuel injector lift in an electromagnetic fuel injector by controlling the space between the armature in a valve body assembly and the pole piece in a housing member, comprising the steps of:

determining the desired fuel injector valve lift (Lift) for discharging a desired rate of fuel flow from the injector valve;

forming a spacer having a first predetermined thickness;

measuring the distance (Y) between the armature and a first surface in the valve body assembly;

measuring the distance (X) between the pole piece and a second surface in the housing member, wherein the first and second surfaces are axially aligned, spaced apart, opposed surfaces;

calculating the desired spacer thickness according to the following equation and generating an electrical signal proportional to said calculation:

$$\text{spacer thickness} = \text{Lift} + Y - X,$$

wherein the armature extends outwardly of the first surface and the pole piece extends inwardly of the second surface;

responding to said electrical signal for reducing the first predetermined spacer thickness to the calculated spacer thickness;

placing the spacer between the first and second surfaces; and then

assembling the housing member, the valve body assembly and the spacer into an unitary fuel injector wherein the fuel injector valve lift is equal to the calculated spacer thickness.

3. A system for automatically assembling an electromagnetic fuel injector with a predetermined injector lift wherein the injector comprises a valve body member having an armature therein controlling the valve opening and a housing member enclosing said valve body member, the housing member having a pole piece magnetically coupled to the armature, said system comprising:

differential gaging means for measuring a first distance between one end of the armature and a first surface on the valve body member, measuring a second distance between one end of the pole piece and a second surface on the housing member;

calculation means responsive to said first and second distances and the predetermined injector lift to generate an electrical signal;

press means having an upper and lower shoe means for limiting the stroke of said press means to control the final spacing of the punch and the die of said press means when operated;

stepper motor means responsive to said electrical signal and operable to position at least one of said shoes of said press means;

ring supply means having at least one ring having a thickness greater than the sum of said first and second distances, said ring supply means including means for positioning said at least one ring between said punch and die of said press means;

means for operating said press means compressing said at least one ring to a thickness equal to the final spacing of the punch and the die of said press means forming a spacer; and

second press means receiving said valve body member, the housing member and said spacer between said first and second surfaces and operable for forming a unitary fuel injector.

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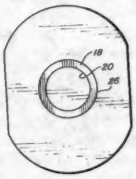
4,610,081

## METHOD OF FABRICATING BATTERY PLATES FOR ELECTROCHEMICAL CELLS

James E. Triner, Euclid, Ohio, assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Aug. 5, 1985, Ser. No. 762,912
Int. Cl.[4] H01M 4/04; B23K 35/24
U.S. Cl. 29—623.1 25 Claims




1. A process for pressure bonding a consumable, reactive metal anode plate to a bipolar plate for use in an electrochemical cell, comprising the steps of:

applying pressure by means of a constant force press to the anode plate in a first area to mechanically bond that area of the anode plate to the bipolar plate; and

applying pressure seriatim by said press to other areas of the anode plate leading away from said first area to progressively mechanically bond those areas of the anode plate to the bipolar plate, thereby forcing out any trapped air from between the plates.

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4,610,082

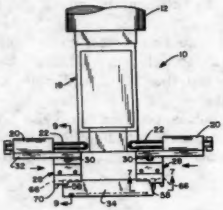
## AUTOMATED EDGE CONNECTOR ASSEMBLY

Daniel J. Anderson, Elmhurst, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Nov. 20, 1985, Ser. No. 799,891
Int. Cl.[4] H05K 3/36
U.S. Cl. 29—741 2 Claims

1. A robotic tool for mounting an edge connector to a predetermined location on a mother board, and mounting a daughter board to said edge connector, said edge connector including a plurality of terminals, each having a board engaging portion mounted in a socket which receives an edge of the daughter board which is inserted at a first angle and is rotated to a second angle to lock said daughter board to said edge connector so that the board engaging portion of the terminals are electrically mated with said daughter board, said tool including a programmable robotic arm selectively moveable to said predetermined position on the mother board and having a free end with a pair of end portions selectively moveable toward and away from each other, the tool comprising:

a pair of jaws moveable toward and away from each other;
means for mounting the jaws to the robotic end portions, for movement therewith;
said jaws having outwardly extending connector engaging portions for selectively engaging the edge connector while said arm is moved to a predetermined position adjacent said mother board and advanced theretoward, whereby the connector is mounted on the mother board; and



said jaws further having opposed inwardly opening pocket-like recesses for receiving, engaging, and supporting said daughter board while said arm is moved to approximately the same predetermined position adjacent said mother board, advanced toward the connector socket at said first angle, and rotated to said second angle, whereby the daughter board is inserted in said connector socket and rotated to said second angle to establish electrical contact between the daughter board and the connector.

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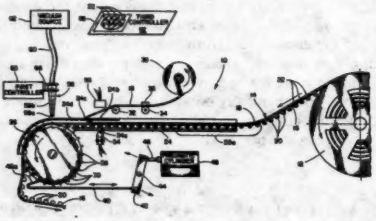
**4,610,083**

## METHOD AND APPARATUS FOR ELECTRONIC COMPONENT MATCHING

**Carl Campisi; David C. Kilinskis, both of Chicago; Peter C. Skerlos, Arlington Heights, and Egil Sorlie, Roselle, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Aug. 26, 1985, Ser. No. 769,822**
**Int. Cl.[4] H05K *3/30;* B23P *19/00***
**U.S. Cl. 29—832** **19 Claims**



1. In the automatic feeding of electronic components of a single type positioned in spaced relation upon a moving component supply tape for sequential deposit upon a circuit board, wherein said electronic components are arranged along said supply tape in first and second groups in accordance with an operating characteristic thereof and wherein said first and second groups are separated by a gap in the components positioned on the supply tape, a system for positioning N electronic components from said first group on a circuit board in an electrically matched arrangement, where N is a positive integer greater than 1, said system comprising:
drive means coupled to said supply tape for linearly displacing in a step-wise manner the supply tape and the electronic components positioned thereon to a pick-up point;
movable engaging means positioned at said pick-up point for engaging and removing an electronic component from the supply tape positioned at said pick-up point and for positioning the electronic component upon the circuit board;
detection means positioned adjacent to the supply tape in spaced relation from said pick-up point in a direction therefrom opposite to the direction of displacement of said supply tape for detecting the absence of an electronic component upon the supply tape and for generating a first detection signal in response thereto; and
first control means coupled to said drive means and to said detection means and responsive to receipt of said first detection signal for sequentially displacing N components from said first group to said pick-up point or for rapidly advancing the supply tape to the second group if there are less than N components remaining in the first group in preventing the positioning of electronic components from the first and second groups upon the same circuit board.

15. A method for positioning first electronic components upon a first circuit board and second electronic components upon a second circuit board, wherein said first and second electronic components are provided in spaced relation upon a supply tape and are arranged in respective first and second separated groups thereon and wherein said first and second electronic components are positioned in combinations of N components upon said first and second circuit boards, respectively, where N is a positive integer greater than 1, said method comprising:
displacing said supply tape in a step-wise linear manner so as to sequentially position each of said electronic components at a pick-up point;
counting the number of first electronic components in the first group as they are displaced toward said pick-up point;
positioning said first electronic components upon said first circuit board if the number of said first electronic components is $\geq N$;
detecting the absence of a first electronic component from the first group;
rapidly displacing said supply tape to the second group of electronic components thereon without removing the remaining first electronic components in the first group if the remaining first electronic components in the first group is $<N$;
replacing said first circuit board with said second circuit board; and
positioning N of said second electronic components from the second group upon said second circuit board.

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**4,610,084**

## METHOD AND APPARATUS FOR INSERTING LEADS INTO HOLES IN SUBSTRATES

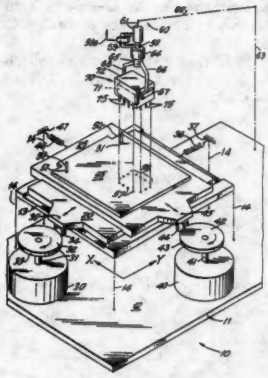
**Carl R. Anderson, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.**

**Filed May 21, 1984, Ser. No. 612,170**
**Int. Cl.[4] H05K *3/30;* B23P *19/00***
**U.S. Cl. 29—834** **2 Claims**

1. A method for inserting a plurality of leads in a pattern into a corresponding plurality of holes formed in a substrate to extend therethrough from a surface thereof and arranged on said surface in a pattern corresponding in size and shape to said lead pattern, said method comprising, holding said leads adjacent said surface to be in contact therewith under pressure for a time period and to be in nominal registration with their respective holes, relatively moving in translation for said period said leads and substrate in two dimensions in the plane of said substrate to produce between said leads and substrate a relative translational vibration in said plane productive of a sweeping for said period of said leads while in said pressure contact with said surface, in two dimensional patterns over areas of said surface centrally including said holes until at the end of said period said leads register substantially exactly with said holes to thereupon be entered therein by said pressure, and, concurrently with said translational vibration, relatively

moving angularly said pattern of leads and said substrate to produce between such lead and hole patterns a relative angular vibration superposed with said translational vibration and adapted to correct for any angular misregistration between said lead pattern and said hole pattern.

2. Apparatus for inserting leads arranged in a pattern into holes formed in a corresponding pattern in substrate and extending through such substrate from a surface thereof, said apparatus comprising: base means for apparatus, carriage means supported by said base means for mounting said substrate, lead positioning means coupled to said base means and operable while holding said leads to position them in said pattern in contact under pressure with said substrate for a time period and in nominal registration for said period with said holes, means to produce relative translational vibration for said



period between (a) said positioning means and (b) said carriage means and the substrate thereon to produce a sweeping for said period of said leads while in pressure contact with said surface over areas thereof centrally including said holes and by such sweeping, to effect at the end of said period a substantially exact registration between said leads and holes and consequent insertion of said leads into said holes under said pressure, and means in a coupled relation with both said carriage means and lead positioning means and interposed in such relation between them to produce concurrently with said relative translational vibration a relative angular vibration between (c) said lead positioning means and said pattern of leads held thereby and (d) said carriage means and substrate with said pattern of holes therein so as to correct in the course of said translational vibration for angular misregistration between said pattern of leads and the corresponding pattern of said holes.

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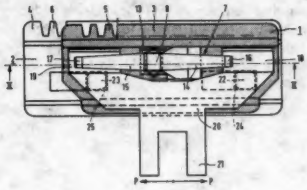
**4,610,085**
**HAIR TRIMMER**

**Pieter Riemersma, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 24, 1984, Ser. No. 685,576**
**Claims priority, application Netherlands, Jan. 5, 1984, 8400037**
**Int. Cl.[4] B26B *19/06***
**U.S. Cl. 30—90** **4 Claims**

1. A hair trimmer comprising a first cutter reciprocated relative to a second cutter, the two cutters having parallel cutting edges provided with teeth; a resilient element urging the two cutters towards one another; and a coupling member coupled to the first cutter; the resilient element including a central portion acting on the second cutter and adjoined by two resilient limbs extending from the central portion through an opening in the first cutter and then away from one another in opposite directions corresponding to the directions of the reciprocatory movement of the first cutter, the distal ends of



the resilient limbs exerting pressure on the first cutter and bearing against the coupling member.

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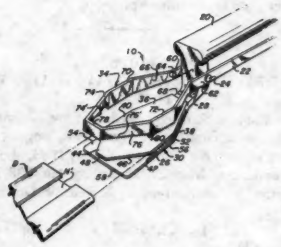
**4,610,086**
**DRIVE NOTCHING TOOL**

**Dominic M. Mastroianni, 1933 Sunbury Rd., Baltimore, Md. 21222**

**Filed Mar. 19, 1985, Ser. No. 713,646**
**Int. Cl.[4] B26B *13/00***
**U.S. Cl. 30—135** **2 Claims**



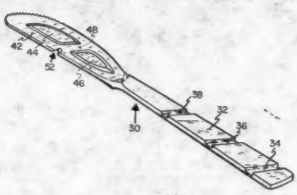
1. A system for one-operation notching and shaping as a soft nose a pre-formed flattened "C"-section sheet metal drive that consists of an elongate flat lower portion having first and second longitudinal upwardly inturned margins with respective edges defining a slot between them and above said lower portion, said system including a first handle and a second handle with respective forward ends, means for pivotally connecting said first and second handles for movement towards each other, a first plate on the forward end of the first handle, a second plate fixed below the first plate with a spacing therebetween proportioned for receiving a said lower portion of a sheet metal drive for shaping as a soft nose, means on an end of the second handle with a shape for coacting in a shearing action with a shape of the first plate and of the second plate and forming a notch in said margins and for removing said margins between the notch and said end of a flattened-"C"-section sheet metal drive, when said first and second handles are moved towards each other about said means for pivotally connecting, said shape of the first plate including: first and second outwardly diagonal edges diverging from the first handle, for shaping a said soft nose by removing part of said lower portion, substantially parallel first and second edges extending forwardly from the first and second diagonal portions, for said removing of margins, and first and second inwardly diagonal edges converging from the respective substantially parallel first and second edges for said forming of a notch.

**4,610,087**

## EATING UTENSIL FOR CORRECTIONAL INSTITUTIONS

**Jim Mickelson, and Barbara L. Winfield, both of Santa Fe, N. Mex., assignors to State of New Mexico, N. Mex.**

**Filed Dec. 24, 1984, Ser. No. 685,446**
**Int. Cl.[4] A47J *43/28***
**U.S. Cl. 30—147** **16 Claims**




1. An eating utensil, such as a fork, spoon or dinner knife, comprising an elongate handle formed of a polymeric material, said handle having a longitudinal axis, and wherein said handle includes a plurality of slots formed therein transverse to said axis so as to prevent said handle of said utensil from being fashioned into a sharp weapon, said slots being of a depth sufficient to render said handle so weak as to effectively preclude it from being sharpened and used as a weapon, and said slots yet being sufficiently shallow that said handle is of sufficient strength for its ordinary purpose.

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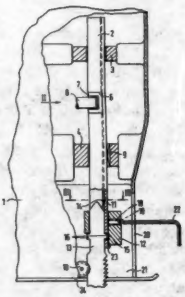
**4,610,088**

## MOTOR-DRIVEN COMPASS SAW WITH SAW BLADE HOLDER

**Gerhard Kuhlmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 540,612, Oct. 7, 1983, abandoned. This application May 29, 1985, Ser. No. 738,733**
**Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245420**
**Int. Cl.[4] B23D *49/04***
**U.S. Cl. 30—372** **10 Claims**



1. A motor-driven compass saw, particularly a hand-held saw, comprising a blade saw having an end portion;

an elongated reciprocating rod of a relatively flat material and having an end facing said saw blade, said reciprocating rod having at least in the region of said end a U-shaped profile with two parallel legs which form a recess therebetween adapted to receive said end portion of said saw blade and to align the latter in the feeding direction, and with a transverse rear wall which connects said legs with one another;

a clamping sleeve surrounding said reciprocating rod and being slidably positioned on said end of said reciprocating rod, said clamping sleeve having a radial bore;

and a screw extending through said bore of said clamping sleeve and abutting against said rear wall of the U-shaped profile of said end of said reciprocating rod without passing through said rear wall, so that said clamping sleeve rigidly secures said end portion inserted into said recess to the end of said reciprocating rod upon tightening of said screw, said reciprocating rod in the vicinity of its end being formed with a transverse slot made in the base of said recess, said end portion of the saw blade having at least one side pin, which is received in said slot upon insertion of the saw blade into said recess.

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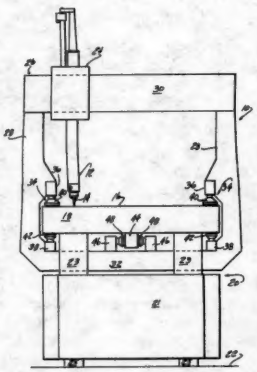
**4,610,089**

## BRIDGE TYPE COORDINATE MEASURING MACHINE

**Frederick K. Bell, and Freddie L. Raleigh, both of Centerville, Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio**

**Filed Dec. 5, 1985, Ser. No. 804,942**
**Int. Cl.[4] G01B *7/28***
**U.S. Cl. 33—1 M** **6 Claims**



1. In combination with a coordinate measuring machine (10) of the type including a base (20) having a table portion (18) spaced above a base portion (21); a bridge (26) having a pair of spaced vertical members (28) an upper cross member (30) connecting together said vertical members (28), above said table portion (18), and a lower cross member (32) connecting together said vertical members (28) below said table portion (18); a probe (12); means mounting said probe for horizontal and vertical motion relative to said upper cross member (30); and means (40, 42) for supporting said bridge (26) for movement on said base (20) in a horizontal direction orthogonal to said probe horizontal movement on said bridge (26), the improvement comprising:

a guide rail (44) located along the central axis of said base (20) and parallel to said table portion (18); and means (46, 48), carried by the central section of said lower cross member (32) for acting on said guide rail movement of said guide rail (44) and said bridge (26) on said support means (40, 42) as said bridge moves in the horizontal direction along the central axis of said base (18).

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**4,610,090**

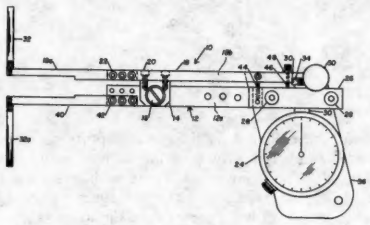
## MEASURING INSTRUMENT

**Thomas Brady, 3514 Tree La., Kingwood, Tex. 77339**

**Filed Oct. 1, 1984, Ser. No. 656,649**
**Int. Cl.[4] G01B *5/02***
**U.S. Cl. 33—148 R** **3 Claims**

1. A caliper gage comprising an elongated main frame defin-

ing at least one elongated planar side surface; a pivot bearing housing having a planar exterior surface; means pivotally mounting said pivot bearing housing to said main frame for oscillation about an axis perpendicular to said one planar surface of said main frame, whereby said planar exterior surface overlies said main frame and pivots in a plane parallel to said one planar surface; an elongated secondary frame; means for detachably securing a medial portion of said secondary frame to said planar exterior surface of said pivot bearing housing, whereby said secondary frame overlies said main frame and is pivotally movable in a plane parallel to said one planar surface of said main frame; a first caliper leg secured to an end portion



of said one planar side surface of said main frame; a second caliper leg secured to an end portion of said secondary frame and cooperable with said first caliper leg to measure a desired dimension on a workpiece, thereby pivoting the other end of said secondary frame relative to the other end of said main frame; and indicator means secured to said other end of said main frame and having a linearly movable actuating stem engaging the other end of said secondary frame; said indicator means being secured to said other end of said main frame so that said actuating stem is shifted in a plane parallel to the plane of said one planar surface of said main frame and by an amount representing a selected ratio to the separation of said caliper legs.

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**4,610,091**

**AUTOMATIC GEAR TESTING APPARATUS**

**Hans-Ulrich Bertz, Rastatt, and Peter Golder, Ettlingen, both of Fed. Rep. of Germany, assignors to Willy Hofler, Karlsruhe, Fed. Rep. of Germany**

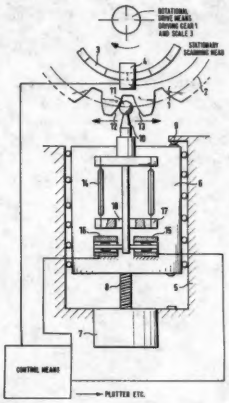
**Continuation of Ser. No. 609,070, May 10, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 804,336**

**Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317249**

**Int. Cl.[4] G01M *13/02***

**U.S. Cl. 33—179.5 R** **4 Claims**

1. An improved automatic test apparatus for testing circumferential spacing as well as for detecting deviations in concentricity, tooth thickness and tooth gaps in gears, in which the gear is driven in one rotational direction for advancement from one measuring position to another, and in which a primary slide is substantially radially displaceable on an apparatus frame by a drive mechanism toward the gear and back away from said gear between adjustable stops, wherein positioning of the gear for the measurement operation is effected by means of a rotational drive means rotationally connected with the gear, further in which a feeler for successive detection of a measured value at right and left tooth flanks of a tooth gap in one measuring step during one revolution of the gear wheel is disposed on the primary slide, further including means for an automatic introduction of the feeler into a tooth gap to be measured and retraction back out of the tooth gap, and means for detection of the respective measured values, the improvement comprising said drive means providing continuous rotation of said gear at a constant speed, a spring means for guiding the measuring feeler parallel to itself for successive measurement of right and left tooth flanks of a tooth gap during rotation of said gear, the measuring feeler being positioned relative to the gear by rotation of the gear between a first measuring position on one tooth flank and a second measuring position on the other tooth flank of the tooth gap to be measured, actuation of the detecting means for pickup and emission of the measured values with respect to the right and left flanks of a tooth gap being effected by a switching position scale on said gear and a scanning head which detects preset switching detection posi-



tions on said scale corresponding to said first and second measuring positions which are arrived at in succession via rotation of the gear wheel, and the detection of the measured values being effected by the measuring feeler being disposed in contact with the right and left flanks successively of the tooth gap.

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**4,610,092**

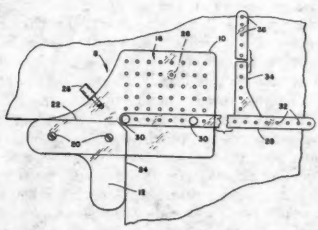
**METHODS AND FIXTURES FOR INSTALLING DRAPERY BRACKETS AND THE LIKE**

**Harry M. Hafele, 4454 Kitty La., Batavia, Ohio 45103**

**Filed Sep. 9, 1985, Ser. No. 773,531**

**Int. Cl.[4] B23B *49/02***

**U.S. Cl. 3—180 R** **3 Claims**



1. A fixture for locating brackets employed in the installation of draperies, and the like, said fixture comprising

a gauge plate having a grid of locating openings extending therethrough,

positioning means projecting in opposite directions from the surfaces of said gauge plate and having aligned positioning surfaces disposed at right angles to each other and offset from the grid of locator openings,

a horizontal extension bar detachably secured to the gauge plate and having locator openings spaced along its length, outwardly of the gauge plate, and

a marking pin insertable through said openings

whereby the gauge plate may be placed against a wall surface, with the grid of locator holes registered in fixed relation to one corner of a window opening by the positioning surfaces and the mounting position of a bracket marked by insertion of the marking pin through a selected locator opening, and then the bracket for the opposite side of the opening marked by positioning the gauge plate in the opposite corner of the opening and inserting the marking pin through the same locator opening.

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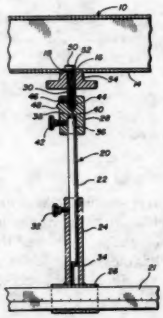
**4,610,093**
**UNIBODY GAUGE SUPPORT**

**Davis R. Jarman, Hortense, and Virgil H. Hinson, Brunswick, both of Ga., assignors to Grabber Manufacturing Company, Brunswick, Ga.**

**Filed Jul. 1, 1985, Ser. No. 750,493**
**Int. Cl.[4] G01B *5/25***
**U.S. Cl. 33—180 AT** **9 Claims**



**1**. In combination with a vehicle including a frame portion having a vertical bore therein from a selected edge of which a frame dimension location is defined, a gauge member including an upstanding mounting shank construction having first and second upper and lower ends, said upper end including means defining a laterally outwardly opening notch of a width extending longitudinally of said shank a distance slightly greater than the length of said bore, the inner extremity of said notch being coextensive with the longitudinal center axis of said shank construction, the upper end of said shank construction being upwardly receivable through said bore at least to a level with said notche registered with a portion of said frame defining said selected edge whereby the latter may be seated in said notch, abutment means carried by said shank construction below said notch and forcibly displaceable upwardly along said shank toward said notch for abutting engagement with said frame portion about said bore to clamp the portion of said frame portion defining said selective edge between said abutment and the portion of said shank defining the upper portion of said notch, the lower end of said shank including location determining means establishing a measurement location coinciding with the longitudinal center line of said shank construction.

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**4,610,094**
**LEVEL**

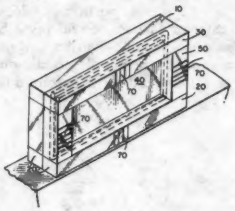
**George Robson, 829 Seventh St., Hermosa Beach, Calif. 90254, and Paul Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677**

**Filed Sep. 19, 1985, Ser. No. 777,658**
**Int. Cl.[4] G01C *9/32***
**U.S. Cl. 33—367** **2 Claims**

**1**. A level comprising:

a clear acrylic plastic body provided with a passageway having walls and adapted to be partially filled with a liquid;

a piece of colored acrylic plastic supported in said clear plastic body and having at least one polished portion which collects light and roughened edge portions which



emit light collected by the polished portion, the light so collected being reflected by the walls of an unfilled portion of the passageway and being visible as a line on the walls of said passageway above a surface of said liquid when said level is supported on a surface.

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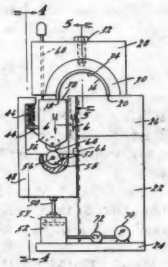
**4,610,095**
**ENGINE BEARING HEIGHT GAGE**

**Reinhard G. Tannery, Brighton, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.**

**Filed Mar. 7, 1983, Ser. No. 472,431**
**Int. Cl.[4] G01B *5/00, 7/00***
**U.S. Cl. 33—517** **12 Claims**



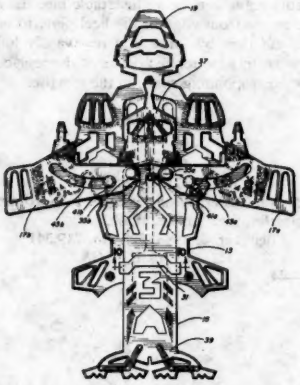
**1**. An apparatus for measuring the interference of semicylindrical bearings or the like formed with diametrically disposed first and second parting edges, said apparatus comprising a shape-conforming bearing cap for receiving and supporting a bearing to be measured, a supporting surface for engaging the first parting edge of a bearing, a gage block reciprocally supported for movement toward and away from said bearing cap including a gaging surface adapted to be disposed in engagement with the second parting edge of a bearing, a carrier supported for movement along an axis, first biasing means for yieldably biasing said gage block toward said carrier, second biasing means for biasing said carrier under a preselected load toward said gage block, coacting means on said carrier and said gage block for intermittently reciprocating said gage block to and from a measuring position in which said gaging surface is disposed in engagement with the second parting edge of a bearing under said preselected load to a second position spaced therefrom, means for restricting movement of said carrier when said gaging surface is in said second position, and means for sensing the interference of a bearing being measured when said gage block is in said measuring position.

**4,610,096**

## TRANSFORMABLE STENCIL TOY

**John T. Sahler, Bethlehem, and Marianne G. Laubach, Easton, both of Pa., assignors to Binney & Smith, Inc., Easton, Pa.**

**Filed Sep. 4, 1984, Ser. No. 647,106**
**Int. Cl.[4] B44D *3/30***
**U.S. Cl. 33—565** **12 Claims**



1. A transformable stencil toy comprising: a main body portion; a sliding body portion in slidable engagement with said main body portion, said slidable engagement having at least two defined limits; at least one pivoting body portion, said pivoting body portion in pivotal engagement with said sliding body portion and in limited slidable engagement with said main body portion, such that when said sliding body portion is at the first limit of its slidable engagement with said main body portion said pivoting body portion is in a first predetermined position such that said stencil toy is in the configuration of a first traceable object, and when said sliding body portion is at the second limit of its slidable engagement with said main body portion, said pivoting body portion is at a second predetermined position such that said stencil toy is transformed into the configuration of a second traceable object.

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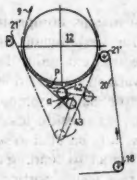
**4,610,097**

## DEVICE FOR THREADING A TRANSFER STRIP OF A PAPER WEB THROUGH THE DRYING CYLINDER SECTION OF A PAPER MACHINE

**Gerhard Kotitschke, and Wilhelm Benz, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany**

**Filed Nov. 30, 1984, Ser. No. 676,546**
**Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344216**
**Int. Cl.[4] F26B *13/10***
**U.S. Cl. 34—117** **7 Claims**



1. An apparatus for threading a transfer strip of a paper web through the drying cylinder section of a paper machine comprising:

a pulley assembly;

an endless elongate guide member carried by said pulley assembly, said pulley assembly being positioned relative to said drying cylinder assembly so that said guide member facilitates the transfer strip being passed across the circumference of one or more of the drying cylinders of the drying cylinder section;

said pulley assembly including a movable pulley means, positioned adjacent a selected one of the drying cylinders, for moving between two positions, when said movable pulley means is in its first position said guide member is permitted to loop around a portion of the selected drying cylinder and when said movable pulley means is moved into its second position said movable pulley means is moved into its second position said guide member is moved away from the selected drying cylinder so as to be spaced apart from the selected drying cylinder;

said pulley means includes a pair of movable pulleys positioned in the area of the wrapped zone of the selected drying cylinder, a first one of said pulley is arranged inside the loop of said guide member so that when said movable pulley means is in its first position said first pulley is positioned in the immediate vicinity of the selected drying cylinder wall, and a second one of said movable pulleys is arranged outside the loop of the guide belt member so that when said pulley means is in its first position said second pulley is positioned near said first pulley; and

when said pulley means is in its first position said guide member follows a path from the selected cylinder over said first pulley to said second pulley and then passes at a slight distance apart from the first pulley back to the selected cylinder.

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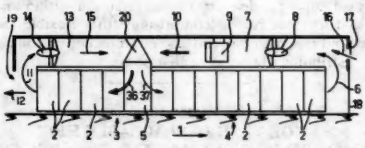
**4,610,098**

## DOUBLE-FLOW DEHYDRATING TUNNEL

**Francois Duc, La Sabatière, 24100 Bergerac, France**

**Filed Apr. 19, 1985, Ser. No. 724,903**
**Claims priority, application France, Apr. 24, 1984, 84 06430**
**Int. Cl.[4] F26B *15/16***
**U.S. Cl. 34—209** **5 Claims**



1. Double-flow dehydration tunnel having a vertical axial plane, in which trucks (2) carrying products which are to be dehydrated pass generally horizontally in a drying channel through which air flows, comprising in succession a countercurrent section (3) in which the trucks move in a direction opposite to the direction of air flow, an intermediate space (5), and a parallel flow section (4), in which the trucks move in the direction as the air flow, with two recycling ducts respectively recycling all the air (6) passing out of the parallel flow section (4) and a fraction (11) of the air passing out of the countercurrent section (3), these two recycling ducts (7, 12) each containing a fan (8, 14) and one (7) of the ducts containing a heater (9), the two currents (10, 15) of these two recycling ducts being converging currents, converging toward said intermediate space (5) in the drying channel, characterized by the fact that the tunnel is provided, above said intermediate space (5), with a collecting and channelling means (20) arranged to collect separately the current of hot air (10) coming from the recycling duct (7) containing the heater (9) and the current of less hot air (15) coming from the recycling duct (13) not containing a heater, to divert these two substantially horizontal currents

into substantially vertical currents and to channel them in the form of a multitude of laminar streams (32, 33) parallel to the vertical axial plane of the tunnel, the streams (32, 33) being in alternate positions and axially offset at least on one edge, in such a manner that their mixing produces a current of air comprising two zones (34, 35) at different temperatures in the direction extending longitudinally of the tunnel and substantially homogeneous in the direction extending transversely thereto, the less hot zone being oriented on the side where the parallel flow section (4) is situated.

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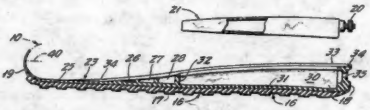
**4,610,099**

## SHOCK-ABSORBING SHOE CONSTRUCTION

**Antonio Signori, Rua Vereador Cibelli, 357, Farroupilha RS, Brazil**

**Continuation-in-part of Ser. No. 599,185, Apr. 9, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,377**
**Claims priority, application Brazil, Sep. 19, 1983, 8305086**
**Int. Cl.[4] A43B** *7/06, 13/18, 13/20*
**U.S. Cl. 36—3 B** **18 Claims**



12. A shoe having a sole characterized by a first or forefoot region of relatively low compliant yieldability, a second or heel region of relatively great compliant yieldability, and a transitional intermediate region between said first and second regions; said heel region comprising a single pocket defined (1) by flexible upper and lower panels extending for substantially the rear half of the sole and (2) by peripheral sidewalls including an internal wall at juncture with said intermediate region, a single inflatable bladder retained within said pocket and peripherally conforming generally to adjacent surfaces of said walls and panels, said bladder having an inflation device including a check valve projecting for external access through one of said sidewalls, said inflation device being the only means of pressurizing-gas delivery to and retention within said bladder; said forefoot region comprising stiffly flexible and relatively void-free material; and said intermediate region comprising a distributed cluster of sealed pockets.

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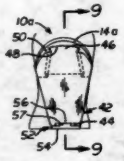
**4,610,100**

## SHOE WITH REPLACEABLE HEEL

**Clifford A. Rhodes, 9101 Golden Gate Blvd., Polk City, Fla. 33868**

**Filed Sep. 30, 1985, Ser. No. 781,854**
**Int. Cl.[4] A43B** *21/36*
**U.S. Cl. 36—42** **10 Claims**



1. A shoe having a heel comprising

(a) a heel plate permanently affixed to the bottom of a heel support portion of the shoe;

(b) the heel plate conforming to the outer contour of the shoe with a rear edge of the heel plate substantially contiguous with the rear edge of the shoe and having at least one mortise for receiving a corresponding tenon projecting from one surface of a replaceable heel, the mortise extending from a front edge of the heel plate in a decreasing transverse width towards the rear edge of the heel plate;

(c) the replaceable heel having a substantially flat first surface and at least one tenon projection on the upper reverse surface corresponding in shape to a space in the mortise; and

(d) the replaceable heel being insertable into the heel plate mortise at the front edge of the heel plate to engage the mortise and then by force in a rearwardly longitudinal direction seating the tenon portion of the replaceable heel into the corresponding space in the mortise.

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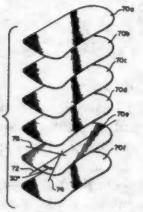
**4,610,101**

## ORTHOTIC INSERT

**Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratories, Inc., Blaine, Wash.**

**Filed Apr. 3, 1985, Ser. No. 719,341**
**Int. Cl.[4] A43B** *13/38*
**U.S. Cl. 36—44** **8 Claims**



1. A substantially unitary orthotic insert adapted to be placed in an article of footwear, said insert having a longitudinal axis parallel to a lengthwise axis of a foot for which the insert is used, and a transverse axis, said insert comprising:

a. a rear portion adapted to underlie and engage a plantar surface of a cacaneal area of the foot;

b. a forward portion adapted to underlie and engage a plantar surface of a metatarsal head area of the foot;

c. an intermediate portion connecting to and extending between said rear and forward portions to engage a plantar surface of a mid-foot area of the foot;

d. said insert having outside and inside edge portions adapted to be positioned adjacent an outside edge and an inside edge of the foot, respectively;

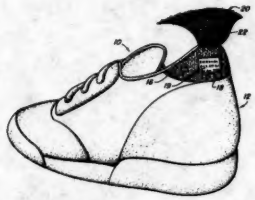
e. said insert having a laminated structure comprising a plurality of vertically stacked layers bonded to one another to form a substantially unitary structure, said laminated structure comprising:

1. first laminate means having an internal material structure adapted to resist bending moments generally uniformly about both of said longitudinal and transverse axes;

2. a second laminate means comprising a layer having fibers which have a predominant orientation of alignment about a direction extending from a rear outside location to a forward inside location, so as to provide greater resistance to bending moments along a first axis extending from a rear outside location to a forward inside location generally parallel to said orientation, and to provide less resistance to bending along a second axis extending from a rear inside portion to a forward outside portion generally perpendicular to said orientation;

f. said laminated structure being characterized in that said structure has an overall greater resistance to bending along said first axis, relative to said second axis.

4,610,102
**VELCRO-ENCAPSULATED LABEL FOR SHOES AND THE LIKE**
Steven C. Hill, 12 Wynridge Rd., Windham, N.H. 03087
Filed Oct. 1, 1985, Ser. No. 782,310
Int. Cl.[4] A43B *23/24*
U.S. Cl. 36—136 4 Claims



1. Apparatus for use in the identification of an individual, comprising:

a hook and loop extensive patch mounted to said heel portion and having an aperture therein to form a cutout window which exposes a surface of said heel portion therethrough while at the same time, providing extensive hook and loop closure to prevent the elements from entering;

an overlying flap of material having a hook and loop inner structure, said flap adapted to be releasably secured to said hook and loop patch; and,

an indicia-carrying device mounted within said aperture such that when said indicia-carrying device is so mounted, and the overlying flap is secured to the underlying patch, said indicia-carrying device is sealed on all sides against moisture and other elements to the heel of said piece of footwear, with the hook and loop encapsulation protecting the indicia-carrying device from the elements.

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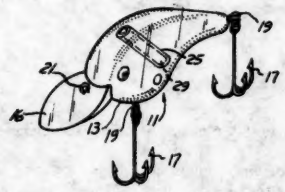
4,610,103
**FISHING LURE**
Kenneth Steinman, 1901 W. Lafayette Blvd., Detroit, Mich. 48216
Filed Jul. 24, 1985, Ser. No. 758,357
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—17.6 6 Claims

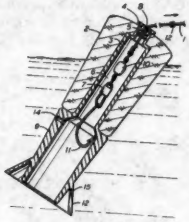


1. In a plug type fishing lure, a hollow formed transparent body having a sealed chamber and a central longitudinal axis;

an elongated open ended transparent tube having a bore projected through said chamber, passing through said axis and at its open ends flush with the outer surface of the body and secured thereto;

an elongated light capsule containing liquid chemicals, snugly and frictionally nested and removably secured within said tube bore, said chemicals when mixed rendering the capsule luminescent for illuminating the lure body.

4,610,104
**CAPSULE FISHING FLOAT**
Julio Garcia, 1402 Fredericksburg Rd., San Antonio, Tex. 78201
Filed Jun. 24, 1985, Ser. No. 747,908
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—41.2 5 Claims



1. In a capsule fishing float, a body member formed of buoyant material, a chamber in said member, a rod mountable in said chamber, being diametrically expanded midway its ends and the lowermost portion being tubular, a vertical axial passageway through said rod and body member through which a fishing line extends, the lower most portion of said rod being sized to allow a weight and hook to move completely within said rod during casting and retrieval; the tubular end of the lower most portion of said rod being surrounded and encompassed by an annularly flared skirt member operable to shield the point of a hook when, per chance, it is caught on said tubular end.

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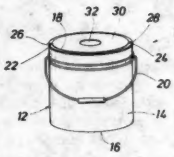
4,610,105
**RODENT TRAP**
Richard G. Chandler, 93 Bert Brown Rd., Conroe, Tex. 77302
Filed May 3, 1985, Ser. No. 730,179
Int. Cl.[4] A01M *23/04*
U.S. Cl. 43—69 8 Claims



1. A trap for catching rodents and other pests and permitting the user to selectively trap the same alive or eradicate them, comprising:

(a) container means having an opening at the upper portion thereof, said container means defining closure support means and forming pivot bushing means;

(b) closure means of generally plate-like form and defining an upwardly opening depression movably engaging said closure support means and being normally generally horizontally positioned in closing relation with said opening of said container means, said closure means having pivot means establishing pivotal engagement with said pivot bushing means, said closure means being movable to an open position responsive to the weight of said rodent or pest, causing said rodent or pest to fall into said container means;

(c) said closure means forms depending wall structure forming said upwardly opening depression for containing bait and being positioned to lure said rodent or pest onto said

closure means said depending wall structure forming a weight containing receptacle; and

(d) a weight member being retained within said weight containing receptacle and being operative to urge said closure to the closed position thereof.

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**4,610,106**
**GARDEN SPACE SAVER**

**Joseph M. Robinson, 158 Eaton St., Buffalo, N.Y. 14208**

**Filed May 23, 1985, Ser. No. 737,182**
**Int. Cl.[4] A01G *17/06***
**U.S. Cl. 47—45** **10 Claims**

1. An installation for growing vining plants in a condensed area comprising:

a basin for holding a soil medium, said basin including a central tubular portion, the tubular portion having a square hole extending through its length and having a plurality of upstanding prongs, said upstanding prongs including means for connecting vine supporting means therethrough;

a supporting pole, said supporting pole having spaced apart end portions of a square shape in cross-section one of said end portions being a lower end portion supportedly held by said square hole of said basin;

a top member having a central tubular portion, the central tubular portion defining a square hole extending through its length for receipt of the other end portion of said supporting pole and including a number of depending prongs equal in number and location corresponding with said upstanding prongs of said basin, said depending prongs including means for connecting vine supporting means therethrough;

vine-supporting means interconnecting at least a plurality of said upstanding prongs with corresponding depending prongs for supporting vines of the vining plants,

means for stabilizing the basin of said installation, said means for stabilizing the basin having a central hole of square cross-section for receipt of the lower end of said supporting pole whereby the position of said installation can be fixed in a desired location.

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**4,610,107**
**VINE TRAINER KIT**

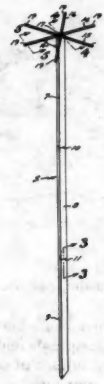
**William B. Testa, 3293 Temple Dr., Huntington Beach, Calif. 92649**

**Continuation of Ser. No. 586,193, Mar. 5, 1985. This application May 15, 1985, Ser. No. 734,586**
**Int. Cl.[4] A01G *17/06***
**U.S. Cl. 47—47** **3 Claims**

1. A vine training kit which is assembled for positioning in a container to train vines to grow upwardly along a plurality of strings, said kit comprising:

a central stake member having a plurality of removably interconnected, longitudinally-alignable sections, the lowermost section being formed with a pointed lower extremity, and the uppermost section being formed with an upwardly-facing upper extremity; and

a plurality of rod members having a length greater than the width of said container, said rod members intersecting each other at their mid-points and removably affixed at their mid-points to said upwardly-facing upper extremity of the uppermost section of said central stake member in a horizontal plane, each of said rod members being relatively angularly displaceable and positionable each with



respect to the other with the upper ends of said strings being attached to the extremities of said rod members for angularly displacing said strings each with respect to the other throughout their extended lengths, and with the lower ends of said strings being affixed to the ground.

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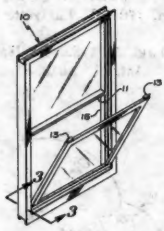
**4,610,108**
**BALANCE SPRING LOCKING SLIDE BLOCK FOR TILT-OUT WINDOWS**

**Gary J. Marshik, Box 353, Canton, S. Dak. 57013**

**Filed Dec. 20, 1984, Ser. No. 684,073**
**Int. Cl.[4] E05D *15/22***
**U.S. Cl. 49—181** **5 Claims**



1. A locking slide block for window jamb channels, comprising:

a body defining oppositely disposed sliding surfaces for guiding the block in a jamb channel, each of the sliding surfaces including an opening therein;

a pair of spaced locking members adapted for selectively engaging the jamb channel and locking the block in a fixed position, the members comprising the opposite outwardly directed ends of a generally U-shaped spring member, the ends of the spring member being serrated for penetrating the jamb channel, the spring member being received within the slide body and a serrated end portion of each member extending through one of the openings, respectively, the ends thereof being normally positioned within the openings on the sliding surfaces in a withdrawn posi-

tion relative to the jamb channel so as not to interfere with the sliding movement of the block therein;

a rotary cam member and a transverse base in the body, the cam member being rotatably housed in the base in the space between the locking members, the cam member having oppositely disposed camming surfaces normally positioned in upper and lower position respectively on the cam whereby rotation of the cam member brings each one of the camming surfaces into contact with one of the locking members to urge them outwardly with respect to the associated sliding surfaces of the body for engagement with the jamb channel, the cam member including an enlarged head portion for holding the spring member within the body and a retaining tab at its end opposite the head portion engaging an end surface of the transverse base for retaining the slide block in assembled condition, and

means included with the cam member for facilitating operative connection between it and a tilt-out window sash for rotating the cam when tilting the window.

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**4,610,109**

## GATE

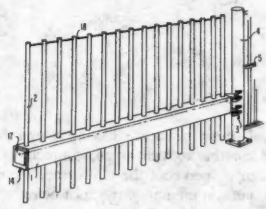
**Franciscus B. M. Ruigrok, Son, Netherlands, assignor to Heras Holding Company B.V., Oirschot, Netherlands**

**Filed May 29, 1984, Ser. No. 614,807**

**Claims priority, application Netherlands, Jun. 6, 1983, 8302007; European Pat. Off., Dec. 5, 1983, 83201728.9**

**Int. Cl.[4] E05D *15/00***

**U.S. Cl. 49—381** **15 Claims**



1. A gate assembly comprising the combination of an elongate girder adapted to be disposed in generally horizontal position above the ground surface and a plurality of upstanding pickets carried by said girder; supporting means for movably supporting said girder from a post to form a gate; a first member at one end of said girder; and prestressing means for placing said girder under longitudinal compression, said prestressing means including a second member at that end of said girder opposite said one end thereof and at least one tension member within said girder and anchored between said first member and said second member, and means for maintaining said tension member under longitudinal tension to compress said girder between said first member and said second member.

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**4,610,110**

## SPINDLE MOUNT FOR ROTARY ABRASIVE TOOLS OR THE LIKE

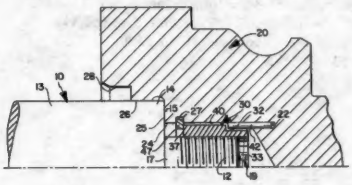
**Robin Renzetti, Coatesville, Pa., assignor to Dunnington Co., Chester Springs, Pa.**

**Filed May 13, 1985, Ser. No. 733,672**

**Int. Cl.[4] B24B *41/04***

**U.S. Cl. 51—168** **20 Claims**

1. In a spindle mount for a rotary abrasive tool or the like onto a threaded spindle end, the improvement comprising a sleeve with a given outside diameter, sufficiently less than the diameter of an axial bore in such tool to be adapted to be inserted thereinto and to be aligned therewithin other than strictly coaxially; the sleeve, at the end thereof to be inserted deepest into such bore, being adapted to be engaged by rotative keying means fixed relative to such tool; the opposite end surface of the sleeve being adapted to abut a complementary surface of ringlike means located at a longitudinally fixed position within the open end of such bore; the sleeve being threaded internally and thereby adapted to screw onto the threaded end of such a spindle, to bear against the inbore side



of such ringlike member, and thereby to move the tool further onto the spindle until an adjacent shoulder on such spindle abuts a complementary face on such tool; the sleeve being thereby adapted to align itself coaxially with such threaded spindle end within such bore despite non-concentricity of threading on the spindle end relative to the axis of rotation of the spindle body.

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**4,610,111**

## ECCENTRICALLY ADJUSTABLE ATTACHMENTS FOR POWER TOOLS

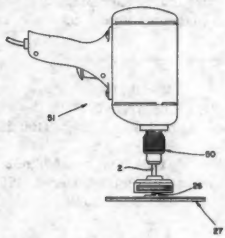
**Alan W. Cox, Cockfield, England, assignor to Black & Decker Inc., Newark, Del.**

**Filed Mar. 18, 1985, Ser. No. 712,623**

**Claims priority, application United Kingdom, Mar. 19, 1984, 8407058**

**Int. Cl.[4] B24B *23/02***

**U.S. Cl. 51—170 MT** **12 Claims**



1. A surface treatment attachment for a power tool, comprising:

a body securable to the power tool for rotation thereby and arranged to receive a treatment head;

means for selecting the degree of eccentricity of the treatment head relative to the axis of rotation of the body;

the body comprising a body portion which is securable to the power tool and an eccentric which is rotatable with the body portion and is arranged to receive the treatment head;

the eccentric being adjustably rotatable relative to the body portion to select the degree of eccentricity of the treatment head;

the rotational position of the eccentric relative to the body portion being continuously adjustable within pre-set limits, the attachment including means for securing the eccentric in the selected position; and

the rotational position of the eccentric being defined by the position of an aperture in the eccentric relative to a circumferentially-extending slot in the body portion, the

securing means extending through the slot and the aperture.

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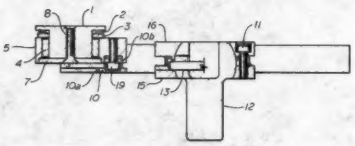
**4,610,112**

## APPARATUS FOR GRINDING AND/OR RECONDITIONING PLANE, ANNULAR SURFACES

**John Kelsey, 424 Wessex Rd., Valparaiso, Ind. 46383**

**Filed Sep. 17, 1984, Ser. No. 650,841**
**Int. Cl.[4] B24B *15/02***
**U.S. Cl. 51—241 VS** **18 Claims**



1. Apparatus for grinding plane annular surfaces comprising:
(a) a planetary wheel;
(b) a plurality of satellite wheels carried in a freely rotatable manner on the outer periphery of the top surface of said planetary wheel, said satellite wheels being rotatable about their respective axes of rotation, such axes of rotation being disposed at a selected angle with respect to the axis of said planetary wheel;
(c) means for adjusting each of said satellite wheels respectively to selected radial distances from the center of said planetary wheel to enable grinding of variable diameter annular surfaces;
(d) means for variably positioning said satellite wheels respectively with the axes of said satellite wheels disposed at selected angles with respect to the axis of said planetary wheel; and,
(e) drive means for rotating said planetary wheel wherein rotation of said planetary wheel causes grinding of said annular surface.

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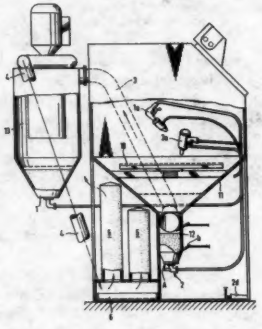
**4,610,113**

## DRY CLEANING BOX

**Mauno O. Fagerroos, Kyrönlukko C 27, 39100 Hämeenkyrö , Finland**

**Filed Dec. 6, 1984, Ser. No. 678,632**
**Claims priority, application Finland, Dec. 8, 1983, 834491**
**Int. Cl.[4] B24C *3/04***
**U.S. Cl. 51—425** **12 Claims**



1. A dry cleaning box for cleaning a workpiece by impingement of particulate material including first and second blasting guns for impinging first and second particulate materials onto a workpiece enclosed within an upper impingement zone of the box, a box funnel connected to said impingement zone of the box for receiving particulate material following impingement on the workpiece and extending downwardly to a funnel outlet, a lower vessel having a vessel inlet communicating with said funnel outlet for receipt of particulate material discharged from said box funnel, a cyclone having an intake duct connected to said box funnel adjacent said funnel outlet, and baffle means mounted adjacent said funnel outlet to direct said first particulate material into said intake duct and said second particulate material into said vessel, said cyclone being operably connected to supply said first particulate material to said first blasting gun, and said vessel being operably connected to supply said second particulate material to said second blasting gun.

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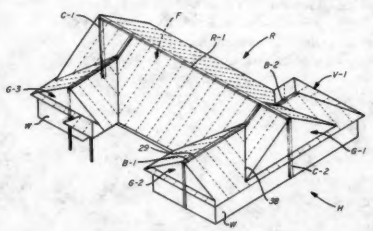
**4,610,114**

## METAL FRAME HOMES

**Don R. Rodriguez, 14922 Royal Birkdale, Houston, Tex. 77048**

**Filed Mar. 5, 1984, Ser. No. 586,432**
**Int. Cl.[4] E04B *7/02, 7/12***
**U.S. Cl. 52—93** **12 Claims**



1. A metal frame residence having a plurality of exterior walls joined together to form an enclosure and a support frame for a gabled or hipped roof therein formed from a plurality of metalized structural members, the roof being of the type having a primary gable or hip and a secondary gable or hip extending substantially perpendicular to the primary gable, said frame comprising:
a first vertical column;
a second vertical column:
a primary ridge rafter for providing support at the ridge of the primary gable, said primary rafter being adapted to span between said first vertical column and said second vertical column;
a plurality of secondary rafters surmounting said primary ridge rafter and adapted to span between said primary ridge rafter and an exterior wall of said residence to form a support for the roof, said secondary rafters being substantially parallel to one another and perpendicular to said primary ridge rafter;
a third vertical column;
a secondary ridge beam spanning between said third column and said primary ridge rafter for providing support at the ridge of the secondary gable, said secondary ridge beam being formed having a horizontally disposed ridge section adapted to form a support member underlying the ridge of the secondary gable, and a sloping section joined to said ridge section at an angle corresponding to the pitch of the primary gable, said sloping section being adapted to complete the transition from the lower secondary ridge line to the higher primary ridge line; and
a plurality of secondary rafters surmounting said secondary ridge beam and adapted to span between said secondary ridge beam and an exterior wall of said residence to form a support frame for the roof, said secondary rafters being

substantially parallel to one another and perpendicular to said secondary ridge beam.

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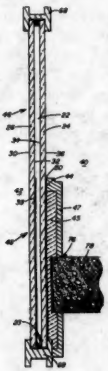
**4,610,115**

## MULTIPLE-GLAZED COMBINATION VISION AND SPANDREL ARCHITECTURAL PANEL AND CURTAINWALL

**Albert E. Thompson, Jr., New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Dec. 17, 1984, Ser. No. 682,134**
**Int. Cl.[4] E04C 2/54; E06B 7/12**
**U.S. Cl. 52—171** **19 Claims**



1. A multiple-glazed combination vision and spandrel architectural panel, comprising:

a first transparent monolithic substrate having first and second surfaces;

a second transparent monolithic substrate having third and fourth surfaces;

means for joining said first substrate and said second substrate to define an insulating air space therebetween;

a transparent, reflective coating applied to one of said first or said second surfaces;

an opacifier applied to a selected portion of one of said third or said fourth surfaces to provide a vision area and a spandrel area integral to said second substrate; and

wherein said transparent, reflective coating and said opacifier are selected to aesthetically harmonize said first and second substrates when the panel is viewed toward said first surface of said first substrate.

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**4,610,116**

## SKYLIGHT ASSEMBLY

**Kenneth Schulz, New York, N.Y., assignor to Soletude, Inc., New York, N.Y.**

**Filed Feb. 7, 1984, Ser. No. 577,681**
**Int. Cl.[4] E04D 13/03**
**U.S. Cl. 52—204** **14 Claims**

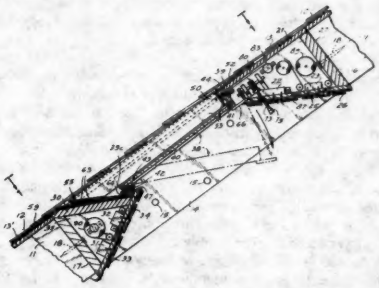
1. A skylight assembly for installation in an opening in the pitched roof of a building, comprising:

a main frame adapted to be secured within the roof opening,

a window including a light-transmitting pane secured within a window frame, the window frame projecting outwardly of the pane at the top and both sides of the pane,

means for mounting the window within the main frame for pivotal movement about one of the ends of the window between a closed position, in which the window is at an inclination generally conforming to the pitch of the roof, and an open position inwardly of the closed position, in which the window is located at an acute angle to the pitch of the roof,

first means for directing water flowing down the roof on to the window, said first means including a flashing having a planar portion for arrangement in a plane parallel to the plane of the roof, and a portion projecting inwardly toward the window pane, said portion having a top wall and two side walls terminating inwardly of the outer surface of the top and side of the window frame so that their free edges are located within the confines of the window frame, and



second means for directing water flowing down and off the window on to a portion of the roof below the main frame, said second means including a flashing member having a ramp portion flanked by outwardly projecting side walls, the upper end of the ramp portion receiving the lower end of the window including the window frame between its side walls, and the flashing member also having a planar portion for arrangement in a plane parallel to the plane of the roof.

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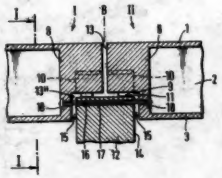
**4,610,117**

## MULTIPLE-SPAN BRIDGE SUPPORT SYSTEM FOR VEHICLES WITH HIGH BRAKING FORCES

**Herbert Schambeck, Frieding/Andechs; Dieter Hilliges, Neuried, and Hans Foerst, Ascheim, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesllschaft, Munich, Fed. Rep. of Germany**

**Filed Aug. 27, 1985, Ser. No. 770,152**
**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432166**
**Int. Cl.[4] E04C 3/10**
**U.S. Cl. 52—227** **7 Claims**



1. A multi-span bridge support system for vehicles with high braking forces, such as a roadway for vehicles moved at least partially magnetically, comprising a bridge superstructure including a row of elongated generally horizontal single-span prestressed concrete girders arranged end-to-end and having torsionally stiff cross-sections, a row of generally vertical support columns spaced apart in the elongated direction of said girders, each said girder comprising a lower base plate extending the elongated direction, a pair of laterally spaced webs extending upwardly from said base plate, a roadway slab plate supported on said webs and with the elongated edges of said roadway slab plate being cantilevered laterally outwardly

from said webs, a cross girder at each of the opposite ends of said girder, and at least two adjacent said single-span girders in said row being fixed at the adjacent ends thereof and being horizontally movable at the other ends thereof, the fixed ends of said at least two girders being supported at one said support column forming a fixed point, said girders at said fixed point being notched in the lower ends of said cross girder at said support column so that the lower part of each said girder adjacent said support column extends downwardly below the upper end of said support column, the notched parts of said girders at the fixed point at said support column each having a vertically extending first surface and a horizontally extending second surface juxtaposed to a corresponding vertically extending first surface and a horizontally extending second surface on the upper end of said support column, and above the notched parts said girders at the fixed point each having a vertically extending third surface juxtaposed to one another, a vertically arranged bearing positioned between each of said vertically extending first surfaces on said girder and said support column, and horizontally arranged tension members disposed generally perpendicularly to said vertically extending first surface and extending through said vertical bearing with the ends of said tension members extending through said cross-girder into said girders for positively pressurizing said vertical bearings, said tension members being free of any bonding action with said support column and said girders through which said tension members extend, and at least one horizontally extending bearing positioned between the horizontally extending second surfaces on said girder and said support column for transmitting vertically acting loads to said support column.

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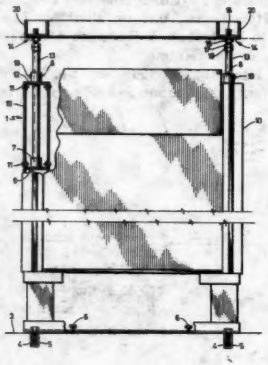
**4,610,118**

## MEDICAL SERVICE COLUMN

**Eugene H. Fullenkamp, Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.**

**Filed Jan. 8, 1985, Ser. No. 689,632**
**Int. Cl.[4] E04H *1/00***
**U.S. Cl. 52—240** **9 Claims**



1. In a medical service column for use in patient room environments, which column is free standing and has front and rear sides with service outlets mounted on at least one of said sides for connection with fluid and electrical conduits, the improvement comprising:

A. retaining and guide means positioned in the upper section of the medical service column for retaining a mounting means and guiding the same in the direction of the patient room ceiling, said retaining and guide means comprising a retaining cup mounted in the upper section of the medical service column in a location to permit the lower end of said mounting means to be inserted therein;

B. means for mounting the medical service column to the patient room ceiling, said mounting means comprising a guide tube and a screw jack assembly, said guide tube having the lower end thereof configured to be inserted into said retaining cup and said upper end configured to receive said screw jack assembly, said screw jack assembly comprising a threaded rod member, the lower end of said rod member being configured to be inserted into the upper end of said guide tube and the upper end of said rod member being configured to be inserted into an aperture in the patient room ceiling; and

C. means attached to said mounting means for securing the medical service column in position with respect to the patient room ceiling said securing means comprising at least two fastening members attached to said threaded rod member, the upper of said fastening members being fixedly attached to said threaded rod member and the lower of said fastening members being threadedly attached to said rod member, and wherein said medical service column is held in position with respect to the patient room ceiling by tightening down on said lower fastening member unitl the upper fastening member abuts against the patient room ceiling and the lower end of the lower fastening member abuts against the upper end of said guide rod; whereby a single medical service column of a fixed height may be employed in patient room environments having varying floor-to-ceiling heights to provide medical services at fixed height with respect to the patient room floor.

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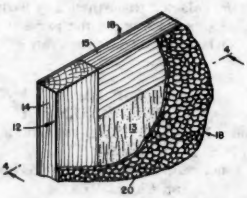
**4,610,119**

## LAMINATED DOOR TO WITHSTAND VANDALISM AND METHOD OF MANUFACTURE THEREOF

**Leigh R. Bench, Sr., 37 St. Andrews Rd., Severna Park, Md. 21146**

**Filed Feb. 13, 1985, Ser. No. 701,166**
**Int. Cl.[4] E04C *1/00***
**U.S. Cl. 52—309.3** **10 Claims**

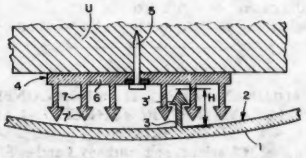


1. A laminated exterior door specifically intended to withstand vandalism, comprising a substrate, a polycarbonate sheet disposed flush against each side of the substrate without any intervening sheet therebetween, the polycarbonate sheets being substantially thinner than the thickness of the substrate, and means including an adhesive bonding each sheet directly to the substrate, the adhesive remaining sufficiently tacky to accommodate the different coefficients of expansion between the substrate and the polycarbonate sheets, thereby allowing the sheets to shift substantially parallel to the substrate without substantial warping or peeling away from the substrate, and thereby maintaining the structural integrity of the laminated door despite temperature variations.

## 4,610,120
## SEAL AGAINST PENETRATION OF WATER INTO MASONRY

**Pietro L. Canavesi, Sementina, and Peter Zwicky, Sarnen, both of Switzerland, assignors to Gunimperm S.A., Castione, Switzerland**

**Filed Feb. 17, 1984, Ser. No. 581,044**
**Int. Cl.⁴ E02D *31/00*; E21D *11/38***
**U.S. Cl. 52—511** **2 Claims**



1. In combination with a masonry construction having an exposed surface, fixing elements secured to said exposed surface, and a waterproof sheet secured to said fixing elements, each of said fixing elements having a plurality of parallel webs thereon extending away from the masonry construction and terminating in arrow-like ends, there being a sufficient plurality of said webs to define a plurality of parallel channels between adjacent said webs, and at least one web on the sheet extending in the direction of the masonry construction and terminating in an arrow-like end having a width greater than the distance between adjacent said heads on the webs of said fixing elements but less than the distance between adjacent said webs of said fixing elements, whereby said sheet can be assembled to said fixing elements by introduction of the arrow-like end on the sheet between any adjacent pair of said ends on the fixing elements, thereby to retain said end on the sheet in any of said plurality of channels of said fixing elements, the material of said webs on said fixing elements being sufficiently resilient to permit the penetration of said end on said sheet into any said channel.

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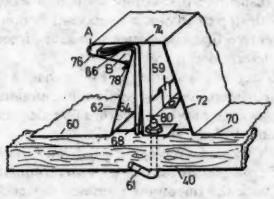
## 4,610,121
## ROOF CLADDING

**Wilfried J. Schenach, P.O. Box 26481, Arcadia, Pretoria, Transvaal, South Africa**

**Filed Dec. 15, 1983, Ser. No. 561,656**
**Claims priority, application South Africa, Mar. 29, 1983, 83/2205; Apr. 18, 1983, 83/2689**
**Int. Cl.⁴ E04D *1/00***
**U.S. Cl. 52—520** **3 Claims**



1. An elongate, transversely profiled roof sheet comprising: at least one elongate ridge and flanking valleys, first and second edge formations along opposed elongate edges of the sheet adjacent the valleys, the first edge formation including juxtaposed first edge flanks meeting in a lock flange bent to extend inwardly and downwardly from the first edge flanks toward the adjacent valley generally in a direction toward the second edge formation, one of the first edge flanks having an upturned lip on its lower outer edge to provide a water run-off channel, the second edge formation incuding a second edge flank terminating in a crest bent to extend outwardly from the second edge flank away from the adjacent valley generally in a direction away from the first edge formation, the crest terminating in a reentrant bend extending to an edge lip to form a generally V-shaped groove extending inwardly and downwardly beneath the crest generally in a direction toward the second edge flank, the opening of the generally V-shaped groove being wider than the width of the lock flange, the lock flange being adapted to be received in the groove of an adjoining sheet with the sheets at an angle therebetween and resiliently engaging the adjoining sheet at two distinct locations within the generally V-shaped groove on the crest and intermediate the reentrant bend and edge lip, respectively, with the sheets in a common plane to thereby form a stessed joint to inhibit rattling, the edge lip engaging one of the first edge flanks with the sheets in a common plane, the engagement of the lock flange within the groove and the edge lip with the second edge flange forming two distinct plenums capable of providing capillary breaks to prevent water ingress by capillary action.

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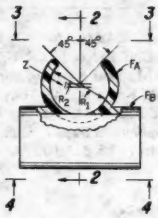
## 4,610,122
## CONCRETE REINFORCING ROD HOLDER

**Marcel D. De Clercq, 20,235 Sunnyside, St. Clair Shores, Mich. 48080**

**Continuation-in-part of Ser. No. 660,012, Oct. 11, 1984. This application Oct. 29, 1985, Ser. No. 792,534**
**Int. Cl.⁴ E04C *5/20***
**U.S. Cl. 52—719** **5 Claims**



1. Improvement in a concrete reinforcing rod holder comprising hollow open-sided sections joined together so as to hold a pair of contacting reinforcing rods prior to pouring concrete to form a reinforced concrete structure, said improvement comprising each said section having a substantially uniform wall thickness and a cavity having inner and outer portions formed therein, the center of the inner portion of said cavity being located so as to coincide with the center of the respective reinforcing rod held therein and the center of the outer portion thereof being radially offset inwardly of that of said inner portion.

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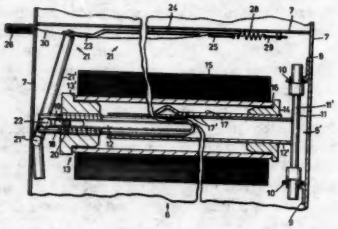
## 4,610,123
## APPARATUS FOR COVERING BALES IN BALING PRESSES

**Bernard Krone, Spelle, and Wilhelm Ahler, Stadtlohn, both of Fed. Rep. of Germany, assignors to Maschinenfabriken Bernard Krone GmbH, Spelle, Fed. Rep. of Germany**

**Filed Oct. 5, 1984, Ser. No. 658,103**
**Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336554**
**Int. Cl.⁴ B65B *11/04***
**U.S. Cl. 53—118** **17 Claims**

10. Apparatus for a baling machine for covering a bale of harvested goods contained in a forming chamber of a baling press, comprising a housing, a supply roll means rotatable in

said housing and on which a supply roll of covering material is disposed, housing support means on one longitudinal end of said supply roll means for supporting said supply roll means from said housing so as to provide for vertical displacement of the other longitudinal end of said supply roll means, support means rotatably supporting said other longitudinal end of said supply roll means, said support means comprising a pivotal lever, pivotal lever support means pivotably supporting said pivotal lever on said housing, connection means pivotably



connecting said pivotal lever to said other end of said supply roll means, said support means further comprising braking means carried by said pivotal lever for applying a braking force to said supply roll means when said pivotal lever is pivoted in one direction, whereby the magnitude of the braking force applied by said brake means is continuously proportional to the weight of said supply roll means, and actuating means manually actuable and operable connected to said pivotal lever to pivot said pivotal lever in an opposite direction to thereby reduce or cancel said braking force.

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**4,610,124**

**METHOD OF BUNDLING ELONGATE ARTICLES**

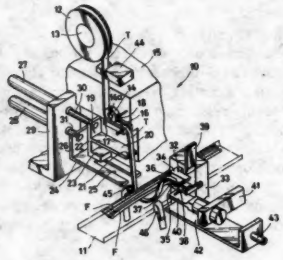
**Kozo Watanabe, and Masashi Kawada, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan**

**Filed Aug. 10, 1984, Ser. No. 639,319**

**Claims priority, application Japan, Aug. 11, 1983, 58-147245**

**Int. Cl.[4] B65B *13/32***

**U.S. Cl. 53—399** **3 Claims**



1. A method of bundling a number of elongate articles with a band, comprising the steps of:

(a) feeding an untensioned length of a band web while gripping a free end thereof at a first fixed position, and thereafter holding the opposite end of the length of the web in a second fixed position against further feeding so that said length of the band web takes an untensioned gravity-formed upwardly open U-shape between said first and second fixed positions;

(b) thereafter placing a number of elongate articles on said length one-at-a-time;

(c) holding said elongate articles placed on said length;

(d) gripping said free end and said opposite end of said fixed length together at said first fixed position to cause said length to surround said elongate articles, while simultaneously gripping the prospective free end of the next length of band web at said first fixed position;

(e) fusing only the two end portions of said length to each other while gripping all of said three ends at said first fixed position;

(f) cutting said length off said band web while gripping all of said three ends at said first fixed position;

(g) releasing said free end and said opposite end while maintaining the gripping on the free end of said next length of band web at said first position, thus producing a banded bundle of said elongate articles; and

(h) discharging said elongate articles bundled by said band.

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**4,610,125**

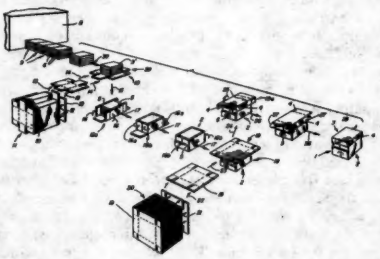
**METHOD AND APPARATUS FOR CONFINING WRAPPED REAMS OF PAPER SHEETS IN CARDBOARD BOXES**

**Otis E. Meives, Cleveland, and Anthony Lutzke, Elkhart Lake, both of Wis., assignors to PEMCO Inc., Sheboygan, Wis.**

**Filed May 3, 1985, Ser. No. 730,872**

**Int. Cl.[4] B65B *11/18***

**U.S. Cl. 53—462** **35 Claims**



1. A method of assembling block-shaped commodities each of which has six sides with first and second components of confining means therefor, particularly of confining arrays of paper stacks in converted blanks of carboard or the like, comprising

(a) the first step of transporting successive commodities in a predetermined direction to a predetermined position at a first level;

(b) the second step of conveying successive first components into register with the respective commodities in said position;

(c) the third step of jointly moving successive commodities and the respective first components to a second level;

(d) the fourth step of advancing successive commodities and the respective first components in said direction along a first predetermined path;

(e) the fifth step of converting, not later than in the course of said fourth step, successive first components into first receptacles each of which overlies five sides of the respective commodity;

(f) the sixth step of conveying successive second components of confining means to a predetermined position of register with the oncoming commodities and the respective first receptacles in a predetermined portion of said first path;

(g) the seventh step of jointly moving the second components with the respective commodities and first receptacles to a third level;

(h) the eighth step of advancing the second components and the respective commodities and first receptacles in said predetermined direction along a second path;

(i) the ninth step of converting, in the course of said seventh and eighth steps, successive second components into second receptacles each of which overlies the sixth side of the

respective commodity and each of which further overlies the respective first receptacle at four sides of the respective commodity; and

(j) the tenth step of maintaining the commodities in a single predetermined orientation in the course of each of said first to ninth steps.

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**4,610,126**

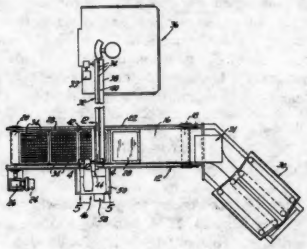
## METHOD FOR TRANSFERRING PARTS FROM A FIRST CONVEYOR TO A RECEPTACLE ON A SECOND CONVEYOR

**Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.**

**Division of Ser. No. 465,166, Feb. 9, 1983, Pat. No. 4,550,551. This application Sep. 23, 1985, Ser. No. 779,047**

**Int. Cl.⁴ B65B** *35/30*

**U.S. Cl. 53—475** **13 Claims**



1. A method for transferring parts travelling in a single row along a first axis of travel on a first conveyor to a receptacle travelling on a second conveyor along a second axis of travel at an angle to said first axis of travel, said parts being placed in said receptacle on said second conveyor in consecutive rows of a predetermined plurality of said parts, said method comprising disposing an elbow-joint arm supported by a stationary housing at a location where said first axis of travel and said second axis of travel intersect, said elbow-joint arm having a first arm pivotable around a single pivot axis relative to said housing and a second arm mounted on the end of said first arm pivotable around a second pivot axis relative to said first arm, said first and second pivot axes being substantially parallel and a part pick-up member being mounted on the end of said second arm, pivoting said first arm relative to said housing, pivoting said second arm relative to said first arm for placing said part pick-up member over said parts on said first conveyor, picking up at least one of said parts by said pick-up member, pivoting said first arm relative to said housing and pivoting said second arm relative to said first arm such as to place said part pick-up member over said receptacle on said second conveyor, and releasing at least said one of said parts from said part pick-up member for placing it in said receptacle.

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**4,610,127**

## COMBINE HARVESTER

**Jyutaro Eguchi; Junzo Sukenari; Shinzo Kashino; Ryuichi Minami; Tetsuichi Odahara, and Masahiro Iwashita, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan**

**Continuation of Ser. No. 618,711, Jun. 8, 1984, abandoned. This application Aug. 22, 1985, Ser. No. 767,675**

**Claims priority, application Japan, Jun. 15, 1983, 58-91773**

**Int. Cl.⁴ A01F** *12/10*

**U.S. Cl. 56—14.6** **2 Claims**

1. A combine harvester comprising a reaping section, a conveyor section, a threshing section, a separation section and a driving section,

said threshing section including a threshing chamber with a transverse threshing drum therein,

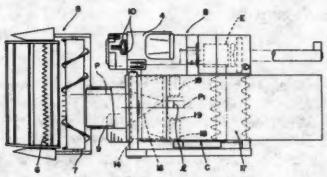
said separation section disposed rearwardly of said threshing section with a longitudinal center line that aligns with a longitudinal center line of said threshing section and includes a straw walker extended longitudinally of said threshing section,

said driving section being in parallel with said threshing section and said separation section juxtaposed therewith and including steering control means, a seat and an engine disposed rearwardly of said seat,

said reaping section disposed forwardly of said driving section and said threshing section and having a transverse width which is substantially as great as the combined transverse width of said reaping section and said driving section, said reaping section having a longitudinal center line offset toward said driving section relative to said longitudinal center line of said threshing section,

an auger disposed parallel with said reaping section between said reaping section and said conveyor section, said auger adapted to gather reaped stalks and to convey said reaped stalks inwardly from the opposite outer ends of said auger to an inner portion thereof in alignment with a longitudinal center line of said conveyor section,

said conveyor section disposed between said auger and said



threshing section with the longitudinal center line thereof in alignment with said longitudinal center line of said threshing section and having a transverse width which is less than the transverse width of said threshing chamber,

guide means having a substantially V-shape disposed in an upper portion of said threshing chamber, said guide means comprising a V-tip end located above a rear portion of said threshing chamber with the V-tip end offset toward said driving section from said longitudinal center line of said threshing chamber and two diverging legs extending from the V-tip end toward a front portion of said threshing chamber, said V-tip end being offset from the longitudinal center line of said threshing chamber toward said driving section and located on a longitudinal line between the longitudinal center lines of said threshing chamber and said reaping section, one of said legs of the V-shaped guide means being adjacent to the driving section, shorter in length and having a smaller angle with respect to a center line through the tip of the V-shaped guide means than the other leg such that free ends of said two legs of the V-shaped guide means can be positioned substantially in a symmetrical relationship with respect to the longitudinal center line of said threshing chamber.

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**4,610,128**

## FODDER CONDITIONING DEVICES

**Rino Ermacora, Saverne, France, assignor to Kuhn, S.A., Saverne, France**

**Filed Jun. 3, 1985, Ser. No. 740,225**

**Claims priority, application France, Jun. 7, 1984, 84 09095**

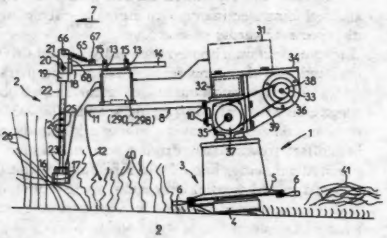
**Int. Cl.⁴ A01D** *43/00, 91/04*

**U.S. Cl. 56—16.4** **29 Claims**

1. An agricultural conditioning device for producing a field of electrical discharges through which an agricultural product passes as the conditioning machine moves along the ground, said conditioning device comprising:

at least one group of electrodes connected to each other in parallel and an electrical control system adapted to re-

ceive an alternating current signal and to discharge said electrodes a predetermined number of times within each period of said alternating current signal so that the field of electrical discharges comprises sparks produced at a controlled rate,



said electrical control system comprising capacitance means that is sequentially discharged during each period of said alternating current signal to generate a sequence of voltages, each of which cause a discharge of at least one of said electrodes.

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**4,610,129**

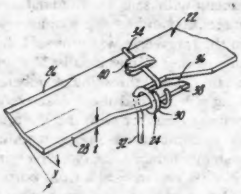
## LAWN MOWER BLADE WITH VARIABLE DEPTH THATCHING DEVICE

**Robert M. Bolger, Swanton, Ohio, and Neil L. Marko, Bloomfield Hills, Mich., assignors to Universal Industrial Products Co., a Div. of Core Industries, Inc., Pioneer, Ohio**

**Filed Jul. 19, 1985, Ser. No. 756,997**

**Int. Cl.[4] A01D** *53/02, 51/00*

**U.S. Cl. 56—17.5** **8 Claims**



1. A combination cutting blade for a rotary lawn mower with the combination comprising:

an elongated, generally flat cutting blade having cutting surfaces at alternate end edges, said cutting blade having upwardly extending vanes on end edges opposite said alternate end edges, said vanes extending upwardly at an angle of between 45° to 50° with the plane of the remainder of said cutting blade, said cutting surfaces and said vanes extending from the blade ends of said cutting blade for between 30% to 40% of the distance from said blade ends to the midpoint of said cutting blade,

thatching devices located at opposite end portions of said cutting blade proximate to said cutting surfaces,

each of said thatching devices having a coiled body portion terminating at opposite ends in generally radially extending leg portions, securing means being selectively operable with one of said leg portions for holding said thatching devices to said cutting blade with the other one of said leg portions depending downwardly from said cutting blade to provide a thatching action,

said securing means being alternately selectively operable with the other of said leg portions for holding said thatching devices to said cutting blade with said one of said leg portions depending downwardly from said cutting blade to provide a thatching action, said securing means including tongues formed along the same edges as said vanes and located proximate to said vanes in a generally flat portion of said cutting blade, said securing means including an upwardly extending tab located intermediate the opposite edges of said blade and generally in alignment with said tongues width wise of the blade, said leg portions extending generally in quadrature with each other with each being radially offset from the axis of said coiled body portion of a distance no greater than the thickness of said cutting blade in the area of said tongues and said tabs,

said coiled body portion adapted to be moved onto said tongue in a clearance relationship with said one or other of said leg portions located beneath said tab and with the remaining one of said one or said other of said leg portions depending downwardly,

said one leg portion being substantially longer than said other leg portion whereby the distance between said cutting surfaces and the active thatching extremities of said thatching devices can be selectively varied by securing said thatching devices with said one or said other of said leg portions depending downwardly for thatching action, said other of said leg portions having a length of between 1.60 inches to 1.90 inches, said one leg portion being between $\frac{1}{4}$ inch to $\frac{3}{4}$ inch longer than said other leg portion, whereby a lawn can be cut to a desired height and simultaneously thatched to a desired depth.

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**4,610,130**

## APPARATUS FOR PICKING UP PLANT MATERIAL LYING ON THE GROUND

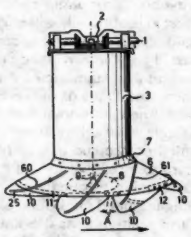
**Paul E. Müller, Herdernstrasse 16, 8004 Zurich, Switzerland**

**Filed May 31, 1984, Ser. No. 615,991**

**Claims priority, application Switzerland, Jun. 8, 1983, 3131/83**

**Int. Cl.[4] A01D** *78/10*

**U.S. Cl. 56—370** **16 Claims**



1. Apparatus for picking up and processing plant material lying on the ground with at least one rotor (3) rotating around a vertical axis and having on its bottom a collar (6), to which a plurality of replaceable ground probing and plant material pick-up elements (20) which are subject to wear are arranged and attached adjustably around an attachment point (23) approximately vertical to said collar.

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**4,610,131**

## METHOD OF FORMING AIR TEXTURED BOUCLÉ YARN

**Paul W. Eschenbach, Moore, and André M. Goineau, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.**

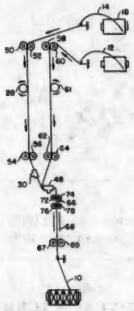
**Continuation of Ser. No. 689,168, Jan. 7, 1985, abandoned, which is a division of Ser. No. 662,573, Oct. 19, 1984. This application Jan. 6, 1986, Ser. No. 816,507**

**Int. Cl.[4] D02G** *1/16, 1/20, 3/34, 3/38*

**U.S. Cl. 57—6** **2 Claims**

1. The method of producing a bouclé type yarn comprising the steps of: supplying a multifilament, partially oriented, synthetic effect yarn, drawing said effect yarn, air jet texturing

said effect yarn after drawing of same, supplying a multifilament, untextured partially oriented synthetic core yarn, drawing said core yarn, entangling said drawn core yarn and said air textured effect yarn in an air texturing jet, allowing said entangled yarn to stabilize and taking up the entangled yarn.



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4,610,132

## COMPRESSED AIR THREAD SPLICING DEVICE

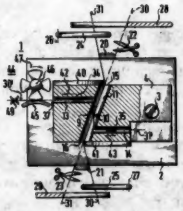
Joachim Rohner; Heinz Zumfeld, and Reinhard Mauries, all of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 701,942

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405304

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—22 9 Claims



1. Compressed air thread splicing device for producing a knot-free thread connection by splicing, comprising a splicing head having a splicing channel formed therein with two at least partially open ends for receiving threads to be joined in a given insertion direction and for alternately tangling, intertwining, swirling and winding fibers of the threads around each other, said splicing head having at least one compressed air inlet orifice formed therein leading into said splicing channel, said splicing head having at least one flow-channel formed therein branching off from said splicing channel transverse to said given insertion direction between said at least one inlet orifice and one of said ends of said splicing channel, and switchable means connected to said at least one flow channel for generating a temporally limited current in said at least one flow channel in a flow direction away from said splicing channel, said current generating means including an injector leading into said at least one flow channel.

4,610,133

## MAKE-READY DEVICE FOR READYING A THREAD END

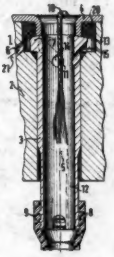
Joachim Rohner; Reinhard Mauries, and Heinz Zumfeld, all of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,010

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342283

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—22 2 Claims



1. Make-ready device for making a thread end ready preparatory to tying it to another thread end in a thread tying device, the make-ready device including a hollow body open at opposite ends thereof and traversible by a gas flow for receiving the thread end therein so as to at least partly stretch and parallelize the fibers of the thread end and cleanse them of short fibers, as well as for retaining the thread end therein, the gas flow being generated by an injected pressurized gas current, comprising pneumatically operative means conducting the injector gas for guiding the thread end in a central region of the inner hollow space of the hollow body, a pressurized-gas guiding device formed as a ring channel surrounding the hollow body, and downwardly inclined passageways lead in different directions form the ring channel into the inner hollow space, at least one of said passageways extending tangentially to and terminating in said inner hollow space.

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4,610,134

## THREAD DRAW-OFF NOZZLE FOR AN OPEN-END ROTOR SPINNING MACHINE

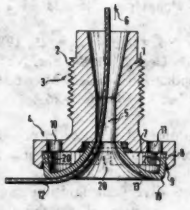
Dieter Busch, Wegberg, and Ulrich Sannig, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,812

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344741

Int. Cl.[4] D01H *1/135, 13/04*

U.S. Cl. 57—417 12 Claims



1. Thread draw-off nozzle for an open-end rotor spinning machine, comprising a nozzle body, and an exchangeable

thread inlet funnel connected to said nozzle body, said thread inlet funnel being constructed as a drawn sheet-metal member.

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**4,610,135**

## COMBUSTION EQUIPMENT FOR A GAS TURBINE ENGINE

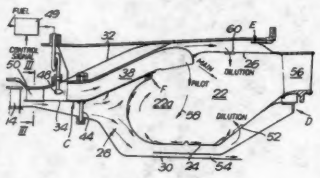
**Eric A. Alexander, Aston-on-Trent, England, assignor to Rolls-Royce plc, London, England**

**Filed Nov. 23, 1981, Ser. No. 325,310**

**Claims priority, application United Kingdom, Dec. 10, 1980, 8039143**

**Int. Cl.⁴ F02C *1/00***

**U.S. Cl. 60—39.01** **8 Claims**




1. Combustion equipment downstream of a compressor of a gas turbine engine, said combustion equipment comprising:

a flame tube;

an air casing in which said flame tube is located, said air casing being divided into two separate regions, each of said regions arranged to receive compressed air from said compressor of said gas turbine engine;

air ducting in one of said regions, said air ducting including angularly arranged pilot air ducts having pilot fuel injectors in upstream ends thereof alternating with angularly arranged main air ducts having main fuel injectors in upstream ends thereof, said pilot air ducts having downstream ends with outlets opening into said flame tube and arranged to direct a fuel/air mixture transversely into said flame tube to form a single recirculation vortex in a recirculation zone, said main air ducts having downstream ends with outlets opening into said flame tube and arranged to direct a fuel/air mixture into said flame tube with a substantial component of direction downstream of said flame tube;

flow directing means immediately upstream of said air ducting to direct air substantially axially into said air ducting;

and cooling air ducting in the other of said regions of said air casing, said cooling air ducting being arranged to receive compressed air having a swirl component from said compressor, said cooling air ducting including at least a part of the upstream end of said flame tube.

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**4,610,136**

## DEVICE FOR IGNITION OF THE POWDER IN POWDER ENGINES AND POWDER-OPERATED TURBINE ENGINES

**Jan J. V. Abom, 12 Poppelgatan, S-421 74 Västra Frölunda, Sweden**

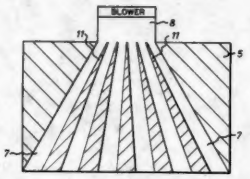
**Continuation of Ser. No. 488,078, Apr. 25, 1983, abandoned. This application Dec. 28, 1984, Ser. No. 687,490**

**Claims priority, application Sweden, May 6, 1982, 8202835**

**Int. Cl.⁴ F02C *3/26***

**U.S. Cl. 60—39.464** **8 Claims**

1. A device for ignition of powder in powder engines and power-operated turbine engines, comprising a powder inlet passage through which powder flows, wall means defining a plurality of elongated divergent ignition slots having their length inclined to the direction of powder flow in said inlet passage, means for heating said ignition slots to a temperature higher than the ignition temperature of the powder, and means for blowing powder through said inlet passage into said slots and forcing particles of said powder to impact repeatedly upon said wall means with sufficient friction between the powder




particles and said wall means at the temperature in said slots to cause said powder to ignite in said slots.

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**4,610,137**

## REGENERATIVE GAS TURBINE CYCLE

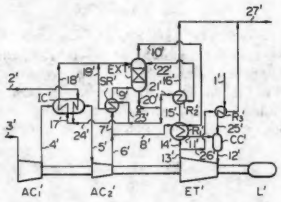
**Hiromi Nakamura; Takehiko Takahashi, both of Chiba; Norio Narazaki; Kazuo Yamamoto, both of Kanagawa, and Norio Sayama, Chiba, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Division of Ser. No. 448,322, Dec. 9, 1982, Pat. No. 4,537,023. This application Jun. 13, 1985, Ser. No. 744,238**

**Claims priority, application Japan, Dec. 10, 1981, 56-199362; Dec. 10, 1981, 56-199364**

**Int. Cl.⁴ F02C *3/30, 7/143***

**U.S. Cl. 60—39.511** **2 Claims**




1. A regenerative gas turbine cycle system with water addition wherein that recovery is carried out by both a mixture of compressed gaseous medium/steam and cooled water which are obtained through a contacting operation, said system comprising:

a gas turbine for production of power;

a compressor driven by the gas turbine for compressing a gaseous medium to a predetermined pressure;

a conduit for introducing the gaseous medium to the inlet of the compressor;

a after-cooler for cooling a compressed gaseous medium for a contacting operation;

a conduit for conducting compressed gaseous medium discharge from the compressor to the after-cooler;

a contacting chamber for saturating steam into the compressed gaseous medium so that both a single-phase and multi-component mixture of compressed gaseous medium/steam (SPCM) and cooled water are obtained;

a conduit for conducting compressed gaseous medium from the after-cooler to the lower portion of the contacting chamber;

at least two regenerators located in series in the line for discharging gas from the gas turbine;

conduits for introducing the water accumulated in the bottom of the contacting chamber through the second regenerator and the after-cooler to the upper portion thereof;

a conduit for introducing supplemental water to a circulating line;

a conduit for conducting the SPCM from the top of the contacting chamber to the first regenerator;

a conduit for conducting the heated mixture from the first regenerator to the combustion chamber;

a conduit for introducing a fuel to the combustion chamber;

a conduit for conducting the burned gas discharged from the combustion chamber to the inlet of the gas turbine; and

a conduit for discharging the exhaust gas through said at least two regenerators.

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**4,610,138**

## EXHAUST PARTICLE REMOVING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

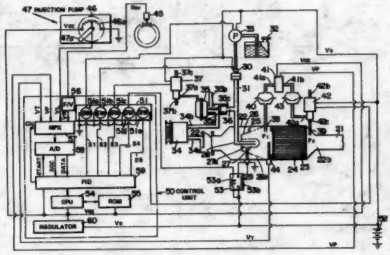
**Motohiro Shinzawa, and Yasuo Nakajima, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Sep. 18, 1984, Ser. No. 651,719**

**Claims priority, application Japan, Sep. 26, 1983, 58-177612; Sep. 30, 1983, 58-183677**

**Int. Cl.⁴ F01N *3/02***

**U.S. Cl. 60—286** **12 Claims**



**1.** An exhaust particle removing system for an internal combustion engine, comprising:

(a) a filter disposed in an engine exhaust passage for trapping particles suspended in exhaust gas;

(b) a burner for burning off the particles deposited on the filter;

(c) means for sensing selectively a pressure in the exhaust passage at a point upstream of the filter and a pressure difference in the exhaust passage across the filter;

(d) means for determining a ratio between the upstream pressure and the pressure difference; and

(e) means for operating the burner on the basis of said ratio.

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**4,610,139**

## HYDRAULIC SPEED CONTROL AND BRAKING APPARATUS FOR DRAW WORKS

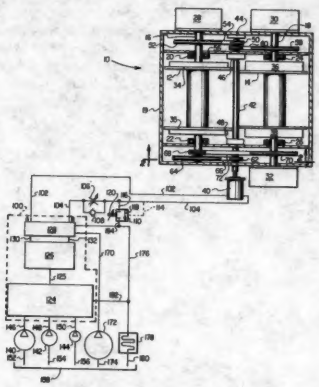
**Michael Skelly, P.O. Box 2687, Pampa, Tex. 79066-2687**

**Filed Jan. 23, 1985, Ser. No. 693,768**

**Int. Cl.⁴ F15B *15/00***

**U.S. Cl. 60—327** **15 Claims**

**1.** In a draw works for use in raising and lowering a string of drill pipe in a borehole, a hydraulic motor for driving the draw works to raise the drill string; means for supplying a first stream of hydraulic fluid from the source to drive the motor; means for permitting said drill string to freely fall into the borehole under the influence of gravity when lowering of said drill string is desired; means for reversing the direction of flow of the first stream of hydraulic fluid; and means for supplying a second stream of hydraulic fluid to said motor when the flow of fluid to said motor is reversed; whereby said flow reversal combined with said second stream of fluid acts to brake said



draw works when said string of drill pipe is freely falling into the borehole and to prevent cavitation in said motor.

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**4,610,140**

## TIDE ACTIVATED GENERATOR

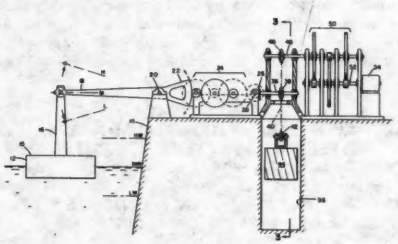
**Randall Thompson, Jr., 3 Craige St., Cambridge, Mass. 02138**

**Continuation-in-part of Ser. No. 581,828, Feb. 21, 1984, Pat. No. 4,541,242. This application May 15, 1984, Ser. No. 610,443**

**The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.**

**Int. Cl.⁴ F03B *13/12*; F16H *21/12, 7/00***

**U.S. Cl. 60—506** **7 Claims**



**1.** Apparatus for mechanically storing energy derived from the rotation of a first shaft and for driving a rotatable main shaft associated with a power generator comprising, in combination,

means for rotating said first shaft,

connecting means for communicating said rotation of said first shaft to a first sprocketed sheave, and

gear train means connecting said rotatable main shaft to a second sprocketed sheave and adapted to cause a rate of rotation of said second sprocketed sheave,

said first and second sprocketed sheaves being in communication with one another by means of continuous, flexible connecting means disposed on said first and second sprocketed sheaves in non-sliding relationship therewith,

said continuous, flexible connecting means having disposed thereon a weight which is raised by the rotation of said first sprocketed sheave,

said second sprocketed sheave being capable of being rotated by the descent of said weight to cause rotation of said rotatable main shaft

said first sprocketed sheave and said second sprocketed sheave being adapted to rotate independently in response to rate of energy derivation and energy requirement, respectively, and

said weight disposed therebetween being adapted to be raised and lowered on said continuous flexible connecting means in automatic response to difference in energy derivation and energy requirement.

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**4,610,141**

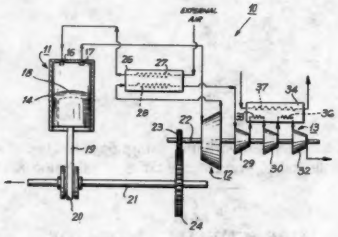
## COMPOUND ENGINE WITH PLURAL STAGE INTERCOOLED EXHAUST PUMP

**Lin-Shu Wang, 21 Hawks Nest Rd., Stony Brook, N.Y. 11790**

**Filed Sep. 21, 1984, Ser. No. 652,701**

**Int. Cl.[4] F02G *3/02***

**U.S. Cl. 60—614** **5 Claims**



1. A compound internal combustion engine comprising a positive displacement internal combustion engine having an inlet and an exhaust gas outlet, a gas turbine drive coupled with said positive displacement engine and having an inlet communicating with said positive displacement engine outlet and a gas outlet, and suction means having a suction inlet connected to said turbine outlet, said suction means comprising a multi-stage turbo-compressor driven by said turbine and having a gas inlet communicating with said turbine outlet and an outlet exhausting into the ambient atmosphere, said multi-stage turbo-compressor including interstage cooling means.

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**4,610,142**

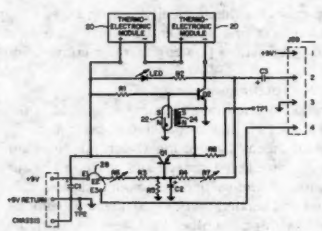
## APPARATUS AND METHOD FOR ADJUSTING A CURIE EFFECT TEMPERATURE SENSING SYSTEM

**Charles L. Davis, Flower Mound, Tex., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed Oct. 19, 1984, Ser. No. 662,875**

**Int. Cl.[4] H01H *51/00*; G05D *23/00***

**U.S. Cl. 62—3** **23 Claims**



1. An apparatus for providing adjustment of the operating temperatures and temperature differential of a curie effect temperature sensing switch, the temperature switch having a closed condition and an open condition, comprising:

means for producing a magnetic field of variable strength extrinsic of and relative to the temperature switch such that the operating temperatures and the temperature differential of the temperature switch can be controlled by the magnetic field produced by the magnetic field means;

first means for incrementally varying the strength of the magnetic field produced by the magnetic field means to adjust the operating temperatures of the temperature switch; and

second means for incrementally varying the strength of the magnetic field produced by the magnetic field means as a function of the temperature switch condition to adjust the temperature differential of the temperature switch.

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**4,610,143**

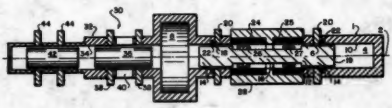
## LONG LIFE VIBRATION CANCELLER HAVING A GAS SPRING

**Fred R. Stolfi, Shrub Oak, and Paul J. Shapiro, New York, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.**

**Filed Dec. 18, 1984, Ser. No. 682,877**

**Int. Cl.[4] F25B *9/00***

**U.S. Cl. 62—6** **18 Claims**



1. A vibration balancing arrangement comprising:

a chamber having a central region having an axis, and a compression region communicating with said central region,

a gas filling which occupies the space at least within said compression region,

a counterbalance mass disposed and axially movable within said central region, having an end face contacted by the gas filling in the compression region, arranged such that the gas in at least the compression region acts as a spring opposing oscillatory movement of the mass in the axial direction, and defines a resonant spring-mass system, and

means for controllably admitting and removing gas to and from the compression region so as to change the gas spring constant, and thereby change the resonant frequency.

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**4,610,144**

## COOLING OF METAL STRIP

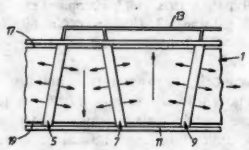
**Kenneth T. Lawson, Hathersage, Nr. Sheffield, England, assignor to Davy McKee (Sheffield) Limited, Yorkshire, England**

**Filed Sep. 12, 1985, Ser. No. 775,405**

**Claims priority, application United Kingdom, Sep. 14, 1984, 8423235**

**Int. Cl.[4] F25D *13/06***

**U.S. Cl. 62—63** **6 Claims**



1. A method of cooling hot metal strip moving substantially horizontal in the direction of its length in which two curtains of liquid coolant are applied onto the upper surface of the strip

with each curtain extending from one edge of the strip to the other, and with the curtains inclined to each other so that at one edge of the strip the curtains are spaced apart horizontally by a greater distance than at the other edge of the strip and where coolant on the upper surface of the strip between the curtains flows to that edge of the strip where the separation of the curtain is greatest.

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**4,610,145**

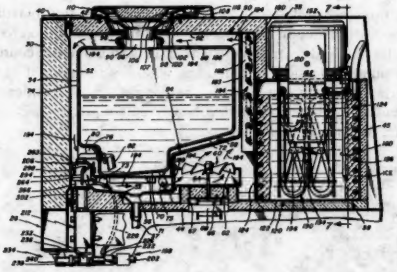
## POST MIX FRUIT JUICE DISPENSER

**William A. Arzberger, 13 Knollwood Rd., Medfield, Mass. 02052; Michael J. Riley, Pembroke, Mass. 02359; Edward J. LaLumiere, 30 Day Cir., Woburn, Mass. 01801, and William H. DeCastro, Jr., B1-8 Lydon La., Halifax, Mass. 02338**

**Filed Sep. 21, 1984, Ser. No. 653,497**

**Int. Cl.[4] F25B *49/00***

**U.S. Cl. 62—127** **18 Claims**



1. A dual beverage dispenser comprising:

a base and a cabinet mounted on the base, said cabinet being open toward the front,

two containers in the cabinet for storing beverage concentrate to be mixed with water to make the two drinks to be dispensed by the dispenser,

a hinged door for opening and closing the front of the cabinet,

an ice bath at the rear of the cabinet,

a stirrer having a propeller in the bath and a motor disposed above the bath,

a refrigeration system including a compressor and condensor in the base and an evaporator in the bath for reducing the temperature of water in the bath,

a pair of dispensing nozzles secured to the base and means connecting the respective nozzles to the different concentrate containers in the cabinet,

a potable water circuit including an inlet for connecting a water source to the dispenser and a cooling coil in the bath for cooling the potable water, said circuit also including ducts connecting the coil to the inlet and to the dispensing nozzles,

an air cooling coil forming part of the refrigeration system in series with the evaporator in the bath and disposed outside the bath in the cabinet,

means including a fan in the cabinet for circulating air in the cabinet over the air cooling coil and about the concentrate containers in the cabinet to maintain the temperature of the concentrates in the cabinet at a selected level,

and a mixing block in each nozzle for combining concentrate and potable water before they are discharged from the nozzles.

**4,610,146**

## OPERATING CONTROL DEVICE FOR AIR CONDITIONER FOR USE IN VEHICLE

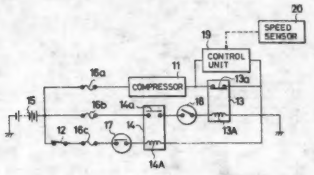
**Yukio Tanemura, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Dec. 17, 1984, Ser. No. 682,290**

**Claims priority, application Japan, Dec. 15, 1983, 58-235145**

**Int. Cl.[4] B60H *1/32*; F25B *27/00***

**U.S. Cl. 62—133** **7 Claims**




1. An operating control device for an air conditioner for use in a vehicle comprising:

means for sensing the temperature of fuel supplied into the engine,

means for detecting the amount of depression of an accelerator pedal, and

means for controlling the operation of a compressor of the air conditioner, wherein said controlling means disables the compressor when said sensing means and said detecting means both detect values exceeding predetermined values, respectively.

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**4,610,147**

## ICE DETECTOR FOR AN ICE MAKING MACHINE

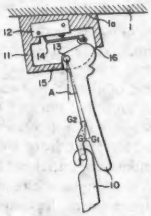
**Masaaki Kawasumi, Shimane, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan**

**Filed Jan. 17, 1985, Ser. No. 692,163**

**Claims priority, application Japan, Jan. 23, 1984, 59-6340[U]**

**Int. Cl.[4] F25C *50/18***

**U.S. Cl. 62—137** **6 Claims**



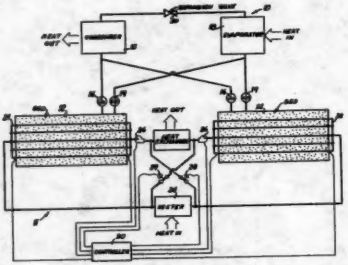

1. An ice detector for an ice making machine, comprising an ice storage switch having a main body for being mounted to an inner ceiling wall of an ice reservoir and a detecting switch, an ice product detecting lever pivotally mounted to a supporting shaft of said main body for engaging said detecting switch and a stopper provided in said reservoir in contact with one end of said ice product detecting lever for holding said ice product detecting lever in a non-vertical position so as to block pivotal movement of said ice product detecting lever toward a vertical position, said ice product detecting lever being pivotable from said non-vertical position in a direction away from the vertical position.

4,610,148

## SOLID ADSORBENT HEAT PUMP SYSTEM

Samuel V. Shelton, 1183 Burnt Creek Ct., Decatur, Ga. 30033

Filed May 3, 1985, Ser. No. 729,921
Int. Cl.[4] F25B *17/08*
U.S. Cl. 62—480 11 Claims



1. A method of operating a heat pump system between an upper operating temperature and a lower operating temperature comprising two solid adsorbent beds connected to the condenser and evaporator in a heat pump circuit so that desorbed refrigerant can flow from the bed by being heated into the condenser and refrigerant from the evaporator can flow into the bed being cooled comprising the steps of:

(a) placing a separate heat exchanger in a heat transfer relationship with each bed and connecting the heat exchangers in series with each other in a closed fluid loop so that heat transfer fluid flows around the closed loop serially through the heat exchangers;

(b) heating the heat transfer fluid passing between one of the ends of the beds to the upper operating temperature;

(c) cooling the heat transfer fluid passing between the other ends of the beds to the lower operating temperature;

(d) circulating the heat transfer fluid around the closed fluid loop serially through the heat exchangers so that the heat transfer fluid passes generally lengthwise of both beds where the circulation rate of the heat transfer fluid is such that the heated heat transfer fluid passing into the end of the bed heats the solid adsorbent bed from an initial cool bed temperature in the vicinity of the lower operating temperature while the bed cools the heat transfer fluid from the upper operating temperature down to about the initial cool bed temperature in a distance less than the length of the bed and with the cooled heat transfer fluid passing into the end of the other bed cooling the solid adsorbent bed from an initial hot bed temperature in the vicinity of the upper operating temperature while the bed heats the heat transfer fluid from the lower operating temperature up to about the initial hot bed temperature in a distance less than the length of the bed;

(e) when the exit temperature of the heat transfer fluid passing out of either of the beds shifts from the initial temperature of that bed by a prescribed amount less than about fifty percent (50%) of the difference between the initial bed temperature and inlet fluid temperature in step (b), changing the circulation of the heat transfer fluid so that the heated heat transfer fluid passes through the cooled bed and the cooled heat transfer fluid passes through the heated bed; and

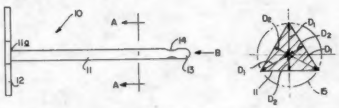
(f) when the exit temperature of the heat transfer fluid passing out of either of the beds shifts from the initial temperature of that bed by said prescribed amount in step (c), changing the circulation of the heat transfer fluid to step (b) to cycle the beds between the upper and lower operating temperatures.

4,610,149

## EARRING SUPPORT

Thomas R. Ireland, Cumberland, R.I., assignor to Hallmark Findings, Inc., Warwick, R.I.

Filed Aug. 3, 1984, Ser. No. 637,713
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 3 Claims



1. A metal support for a pierced earring, comprising an elongaged solid earring post formed of precious metal and having a uniform non-circular cross-section, said uniform cross-section being an equilateral triangle having maximum dimensions in at least two angularly displaced directions to provide substantial resistance to deformation in said two directions, said cross-section having relatively small dimensions in directions between said two directions and being formed having three straight sides joined at acute angles, said maximum dimensions extending from a center of the cross-section to said angles and said small dimensions extending from said center to the middle of said straight sides, whereby the weight of said earring post compared with the weight for a cylinder of a circular cross-section having a diameter equal to said maximum dimensions is minimized.

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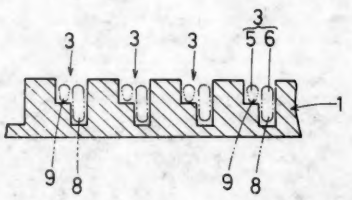
4,610,150

## KNITTED FABRIC, METHOD OF KNITTING SAME AND MACHINE FOR THE SAME

Takenori Hiromoto; Yoshito Hiromoto, and Takuji Hiromoto, all of 747-1, Yoshihara, Wakayama, Japan

Division of Ser. No. 778,527, Sep. 20, 1985, Pat. No. 4,587,811.
This application Jan. 21, 1986, Ser. No. 820,700
Int. Cl.[4] D04B *15/00*
U.S. Cl. 66—115 1 Claim

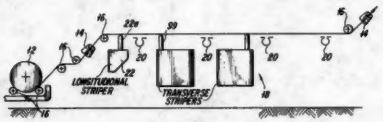


1. A knitting machine in which needle beds are disposed on the dial side and cylilnder side, characterized by being fabricated into a structure wherein a needle groove on one or both of the dial and cylinder sides contains a foundation forming needle bed for guiding the foundation forming needle and a pile forming needle bed shallower than said foundation forming needle, both beds having a common opening part, wherein foundation forming needles and pile forming needles are disposed in said foundation forming needle bed and pile forming needle bed, respectively.

## 4,610,151
## FABRIC DYEING MACHINE

**Ben Z. Sandler, Beer-Sheva, Israel, assignor to B&D Designs Inc., New York, N.Y.**

**Filed May 8, 1985, Ser. No. 731,864**
**Int. Cl.[4] D06B** *1/02, 11/00*
**U.S. Cl. 68—205 R** **19 Claims**

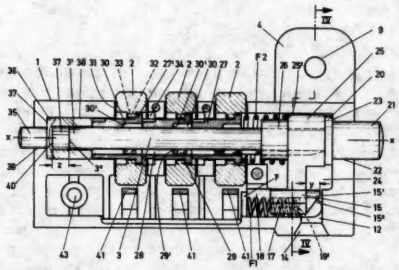



1. A dyeing machine comprising:
a first dyeing station;
a second dyeing station;
means for moving a cloth to be dyed along a predetermined path of travel past said first and second stations;
transverse striping means at one of said stations for selectively applying transverse striping to said cloth;
longitudinal striping means at the other of said stations for selectively applying longitudinal striping to said cloth;
said transverse striping means including at least one movable dyeing nozzle, a generally triangular guide disposed relative to the path of travel of said cloth so as to guide the movement of the dyeing nozzle in relation to the cloth so as to enable dyeing of the cloth by the said at least one nozzle; means for moving said nozzle along said guide at a speed related to the speed of movement of the cloth such as to provide transverse striping of the cloth by said at least one nozzle; and
said longitudinal striping means comprising a plurality of dyeing nozzles arranged in a row extending transversely to the path of travel of said cloth.

## 4,610,152
## COMBINATION LOCK FOR THE SECURING OF SKIS, BICYCLES OR THE LIKE

**Rudi H. Düringer, Wuppertal, Fed. Rep. of Germany, assignor to S. Franzen Söhne (GmbH & Co.), Solingen, Fed. Rep. of Germany**

**Filed Mar. 22, 1984, Ser. No. 592,154**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310499; Mar. 19, 1984, 3410047**
**Int. Cl.[4] E05B** *37/18*
**U.S. Cl. 70—30** **12 Claims**

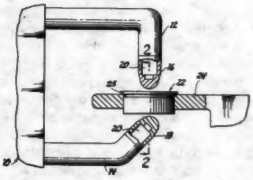


1. In a combination lock adapted for securing skis, bicycles and the like, having a lock housing in which setting disks for setting a lock combination are rotatably supported and from which housing there extends fixed thereto, one end of a loop, the other, free end of which is insertable into an insertion channel in the lock housing and is engageable by a lock member, the improvement comprising
a setting-disk mounting shaft, said setting disks are mounted on said mounting shaft, and a collar on said shaft,
an actuating button inwardly extending into the lock housing and being for actuation when the combination is correctly set, said shaft extending from said inwardly extending actuating button,
said lock member includes a latch located within said insertion channel for catching said free end of the loop,
means for spring biasing said latch,
said latch is operatively mounted on said shaft, displaceable against said spring biasing,
said collar comprises means for disengaging said latch when the lock combination is correctly set by displacement of said collar together with said shaft upon actuation of said actuating button,
means including a push button for changing the lock combination and locking sleeves releasably cooperating with said setting disks and being guided displaceably on said shaft,
spring means for spring biasing said sleeves,
said push button is coaxial with said shaft and mounted on a side of said lock housing opposite said actuating button, said push button extends into a push button collar, said push button collar being located on an inner side of the lock housing and resting against an end one of said spring-biased locking sleeves, and
said push button collar is formed as a cup-shaped bushing, a front end of said shaft is mounted in said cup-shaped bushing, a bottom of said bushing lying spaced at a distance from the front end of said shaft, said distance corresponding to an actuating stroke of the latch.

## 4,610,153
## METHOD AND APPARATUS FOR DRESSING SPOT WELDING TIPS

**Joseph V. Nedorezov, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 515,394, Jul. 20, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,684**
**Int. Cl.[4] B21D** *22/14, 53/00*
**U.S. Cl. 72—112** **5 Claims**



1. The method of dressing the tip of a spot welding electrode subject to accumulating an oxide film without a significant amount of metal or oxide removal comprising the steps of;
rotating a tool having a smooth dressing surface defining a continuous surface of revolution configured to complement the desired electrode tip shape, and
forcing the tip into direct frictional engagement with the rotating tool surface to effect electrode metal flow into the

shape of the dressing surface while preserving the oxide film on the tip, whereby the electrode tip is dressed with essentially no material removal.

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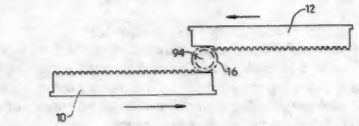
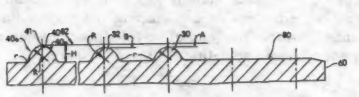
## 4,610,154
## TOOTH FORMING TOOL WITH TOOTHLESS CLAMPING SECTION FOR SPLINING TUBULAR ELEMENTS

**Nicholas J. Carene, Jr., Hazel Park, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.**

**Continuation of Ser. No. 347,748, Feb. 10, 1982, abandoned.**
**This application Jan. 30, 1985, Ser. No. 696,380**
**The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.**
**Int. Cl.[4] B21D *17/04;* B21H *5/00***
**U.S. Cl. 72—88** **1 Claim**




1. In combination with a rotatably supported mandrel having radially extending teeth spaced apart from one another by tooth spaces and terminating in lands, a tool for pressure forming teeth in the periphery of a tubular workpiece carried on the mandrel and adapted to mesh with said rotatable toothed mandrel with the workpiece therebetween, said tool including a body having a leading and trailing end and being provided with a working face therebetween, said working face having an initial toothless clamping section between the leading end and trailing end and a toothed forming section between the clamping section and trailing end including a forming tooth configured to provide an equilateral pointed arch tooth form having radius-defined leading and trailing edges intersecting at the tooth form tip in a substantially sharp peak, said tooth form substantially uniformly deforming the workpiece in the mandrel tooth space, said clamping section being on a plane substantially coincident with the outer diameter of the workpiece when located on the mandrel and of sufficient length to overlie the land of the mandrel tooth adjacent and ahead of the tooth space in which the first forming tooth is intermeshing during initial contact of the toothed section with the workpiece to substantially prevent radial separation of the workpiece from said land of the mandrel tooth ahead of said toothed section.

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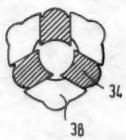
## 4,610,155
## MANUFACTURE OF ARTICLE HAVING UNDERCUT INTERNAL SURFACE

**Edward A. Langford; Reginald L. Neale, and Geoffrey A. Morden, all of Birmingham, England, assignors to PFD Limited, Birmingham, England**

**PCT No. PCT/GB83/00245, § 371 Date May 10, 1984, § 102(e) Date May 10, 1984, PCT Pub. No. WO84/01529, PCT Pub. Date Apr. 26, 1984**
**PCT Filed Oct. 3, 1983, Ser. No. 611,004**
**Claims priority, application United Kingdom, Oct. 14, 1982, 8229391**
**Int. Cl.[4] B21D *22/00***
**U.S. Cl. 72—353** **8 Claims**

1. A tool for use in manufacture of a hollow article having an internal surface at least part of which is undercut, said tool comprising a plurality of circumferentially disposed elements, said elements having portions with surfaces together defining a substantially complete external surface having a configuration corresponding to that required in said internal surface of the article, said elements comprising a number of first elements and a number of second elements interposed between said first




elements; means for withdrawing said portions of said first elements from the article to provide a space between said portions of said second elements; means permitting said portions of said second elements to be moved inwardly into said space to disengage them from said undercut internal surface part, and means for withdrawing said portions of said second elements from said article.

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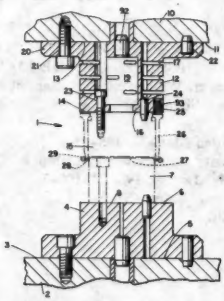
## 4,610,156
## PROGRESSIVE DIE APPARATUS HAVING RESILIENT TOOL SUPPORT MEANS

**Elton G. Kaminski, Sidney, and Richard J. Hasselbeck, Houston, both of Ohio, assignors to The Stolle Corporation, Sidney, Ohio**

**Filed Dec. 20, 1984, Ser. No. 684,708**
**Int. Cl.[4] B21D *22/02***
**U.S. Cl. 72—431** **13 Claims**




1. In a press for performing a variety of operations for forming and making an easy open can end from stcok sheet material said press including a stationary press bed; a tooling base mounted upon said stationary press bed; a lower tooling member mounted upon said tooling base; a press ram overlying said stationary press bed; an upper tooling member suspended beneath said press ram, wherein said stationary press bed, said tooling base, and said upper and lower tooling members are in vertically alignment with one another, so that said operation may be performed upon an easy open can end by said press ram exerting a downward force on said upper tooling member, the improvement comprising a metallic resilent tool support means positioned between and secured to said press ram and said upper tooling member, said metallic resilient tool support means yielding to absorb any excess downward force of said press ram on said easy open can end, said tool support means includes a central bore and a positive stop mounted within the central bore of said resilient tool support means, said positive stop permitting said resilient tool support means to yield until

maximum deflection is achieved and to prevent further yielding past maximum deflection.

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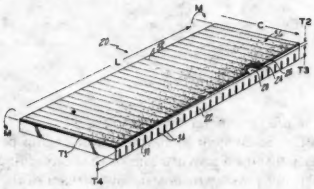
**4,610,157**

## SURFACE PENETRANT INSPECTION TEST PIECE HAVING VARYING THICKNESS PLATING

**Frank J. Vicki, Plantsville, Conn., and Setsuo Shimizu, Yokohama, Japan, assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 11, 1984, Ser. No. 680,437**
**Int. Cl.[4] G01N *19/08***
**U.S. Cl. 73—1 R** **8 Claims**



1. An article for testing the comparative utility of crack penetrants comprised of a substrate having adhered to a first surface a plating of dissimilar material from the substrate, which plating varies in thickness along a length of the substrate, characterized by a plurality of stress concentrators on the second surface of the substrate which opposes the first plated surface, the lengths of the stress concentrators running transverse to the substrate length, the plating having cracks which run essentially parallel to the stress concentrators.

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**4,610,158**

## METHOD FOR DETERMINING THE SEALABILITY OF DRILLING COMPOUNDS

**Richard Lawton, Jr., P.O. Box 747, Berwick, La. 70342**

**Filed Oct. 11, 1984, Ser. No. 659,777**
**Int. Cl.[4] G01N *15/04***
**U.S. Cl. 73—61.4** **8 Claims**

1. A method for for determining particle size distribution in drilling compounds, particularly drilling fluids and cements, in order to determine the drilling fluids and cements ability to seal porous formations, comprising the following steps:

a. providing a measured portion of drilling compound that has been or will be circulated down hole;

b. providing filter means having consistent measured openings therethrough;

c. filtering said drilling compound through said filter means under a given pressure;

d. effecting a drilling compound layered seal on said filter means;

e. filtering additional drilling compound through the filter means under increased pressure over a certain length of time;

f. measuring the amount of filtrate recovered; and

g. determining the rate of formation of said seal as the function of the amount of filtrate recovered.

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**4,610,159**

## SELF-PROPELLED VEHICLE POWER TRAIN EVALUATION

**David Nowak, Dunstable, Mass., assignor to RCA Corporation, Princeton, N.J.**

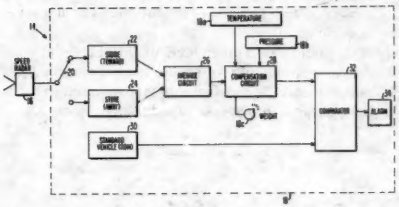
**Filed Dec. 24, 1984, Ser. No. 685,992**
**Int. Cl.[4] G01L *5/13***
**U.S. Cl. 73—116** **5 Claims**

1. A methed for testing a drive train of a self-propelled vehicle having a given weight utilizing a speed measuring radar directed toward said vehicle, comprising the steps of:

operating said vehicle at full acceleration in one of the directions toward or away from said speed measuring radar to a given speed;

recording the signal produced by said radar representing speed of said vehicle versus time;

recording a signal indicative of the difference in weight of said vehicle under test and the weight of a "standard" vehicle against which the vehicle under test is being compared;



compensating the signal representing speed versus time of the vehicle under test by said weight indicating signal; and

comparing the compensated signal against a stored signal representing speed versus time of the said standard vehicle and producing a warning signal if the compensated signal differs from the standard signal representing the standard vehicle by a greater than a preselected amount.

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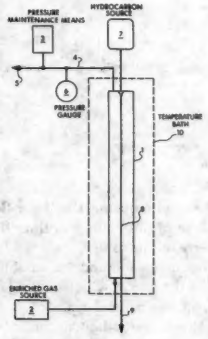
**4,610,160**

## METHOD OF DETERMINING THE MINIMUM LEVEL OF ENRICHMENT FOR A MISCIBLE GAS FLOOD

**Richard L. Christiansen, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio**

**Filed Sep. 16, 1985, Ser. No. 776,724**
**Int. Cl.[4] G01N *33/26***
**U.S. Cl. 73—151** **17 Claims**



1. A method for determining the minimum level of enrichment required to render a substantially immiscible bulk gas miscible in a liquid hydrocarbon comprising the steps of:

(a) charging a sample of an enriched gas comprised of said bulk gas and an enriching fluid wherein the level of enrichment of said enriched gas is substantially below said minimum level of enrichment to a transparent vessel;

(b) maintaining said sample of enriched gas at a predetermined substantially constant temperature and pressure;

(c) discharging a droplet comprised of said liquid hydrocarbon into said vessel such that said droplet falls through said enriched gas in said vessel while continuously and visibly contacting said enriched gas;

(d) observing the behavior of said droplet as it contacts said enriched gas;

(e) withdrawing said droplet and enriched gas from said vessel after said droplet has come to rest in said vessel;

(f) charging a fresh sample of said enriched gas having an incrementally higher level of enrichment than said previous sample to said vessel;

(g) repeating steps b-f, each time incrementally increasing the level of enrichment of said fresh sample over said previous sample, until said droplet is first observed to substantially dissipate in said enriched gas at a given level of enrichment; and

(h) determining said given level of enrichment at which said droplet substantially dissipates in said enriched gas to be said minimum level of enrichment required to render said bulk gas miscible in said liquid hydrocarbon.

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**4,610,161**

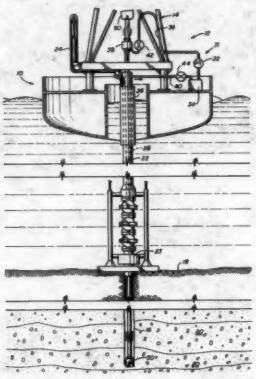
## METHOD AND APPARATUS FOR DETERMINING FLUID CIRCULATION CONDITIONS IN WELL DRILLING OPERATIONS

**George F. Gehrig, and Jerry M. Speers, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.**

**Filed Jul. 5, 1985, Ser. No. 751,930**

**Int. Cl.[4] E21B *47/10***

**U.S. Cl. 73—155** **22 Claims**



4. A system for monitoring the delta flow-rate of drilling fluid in the course of circulating drilling fluid through a well from a drilling rig, comprising:

an inflow flowmeter adapted for establishing a first signal representing the rate at which drilling fluid is injected into the well from the drilling rig;

an outflow flowmeter adapted for establishing a second signal representing the rate at which drilling fluid is returned to the drilling rig from the well; and

a signal processing system adapted for receiving said first and second signals and calculating a third signal representing the filtered difference between the first and second signals, the signal processing system being adapted to repeatedly update the degree of filtering applied in calculating said third signal in accordance with a relation serving to increase the degree of filtering in response to an increase in the magnitude of the cyclical variations in the rate at which drilling fluid is returned to the drilling rig and to decrease the degree of filtering in response to a decrease in the magnitude of the cyclical variations in the rate at which drilling fluid is returned to the drilling rig.

**4,610,162**

## FLUIDIC FLOWMETER

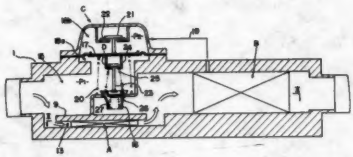
**Makoto Okabayashi, Nabari, and Masao Haruta, Mino, both of Japan, assignors to Osaka Gas Company, Osaka, Japan**

**Filed Jun. 27, 1985, Ser. No. 749,233**

**Claims priority, application Japan, Jun. 27, 1984, 59-97398[U]; Mar. 28, 1985, 60-66345**

**Int. Cl.[4] G01F *7/00, 1/20***

**U.S. Cl. 73—197** **10 Claims**



1. A fluidic flowmeter comprising

a first fluidic element including a converging passage, a jet nozzle disposed downstream of the converging passage, a diverging passage disposed downstream of the jet nozzle, a pair of control nozzles disposed between the jet nozzle and the diverging passage and opposed to each other across and in a direction substantially perpendicular to a direction in which a fluid jet shoots from the jet nozzle, and return passages connecting a downstream position of the diverging passage to the control nozzles, respectively,

a second fluidic element connected to said first fluidic element, said second fluidic element being substantially identical in construction to said first fluidic element and including a jet nozzle having a smaller opening area than the jet nozzle of said first fluidic element, and

a bypass passage communicating with said first fluidic element in parallel with said second fluidic element, said bypass passage including valve means adapted to open when a flow rate exceeds a predetermined value.

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**4,610,163**

## METERING APPARATUS

**Leif B. Johannesson, Tumba, Sweden, assignor to Alfa-Laval Agri International AB, Tumba, Sweden**

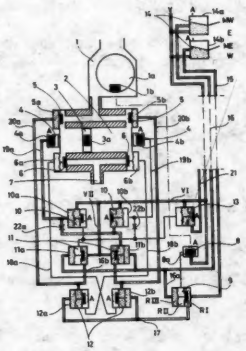
**PCT No. PCT/SE83/00404, § 371 Date Jul. 5, 1984, § 102(e) Date Jul. 5, 1984, PCT Pub. No. WO84/01999, PCT Pub. Date May 24, 1984**

**PCT Filed Nov. 17, 1983, Ser. No. 629,821**

**Claims priority, application Sweden, Nov. 18, 1982, 8206567**

**Int. Cl.[4] G01F *3/16***

**U.S. Cl. 73—250** **13 Claims**



1. Apparatus for metering the volume of a liquid and com-

prising means forming a metering chamber, a piston reciprocable between two end positions in said chamber, each stroke of said piston from one end position to the other corresponding to a certain volume, a liquid inlet conduit and a liquid outlet conduit each adapted for connection to said chamber on each side of the piston, two shut-off valves for each of said conduits, said valves being movable to a first condition wherein two of the valves are in open positions to connect the inlet conduit to the chamber on one side of the piston and connect the outlet conduit to the chamber on the other side of the piston while the other two valves are in closed positions, whereby the piston is moved by said fluid in the direction of said other side, said valves being movable to a second condition in which said positions are reversed, whereby said fluid moves the piston in the direction of said one side, means for sensing when the piston reaches each of said two end positions, said sensing means including a piston magnet carried by the piston and also including magnet devices located adjacent said end positions, respectively, each magnet device being activated by the piston magnet when the piston arrives at the adjacent end position, a vacuum source, and actuating means operable by vacuum from said source and atmospheric air, while under control of said sensing means, to move the shut-off valves alternately to said first and second conditions, said actuating means including control valves operable by said magnet devices, respectively, and relays operable by said vacuum and air under control of said control valves.

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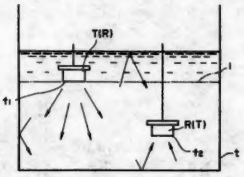
**4,610,164**

## METHOD OF DETECTING LIQUID LEVEL

**Hideo Sobue, and Toshiharu Ito, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Japan**

**Filed Jun. 7, 1985, Ser. No. 742,188**
**Claims priority, application Japan, Jun. 20, 1984, 59-128351**
**Int. Cl.[4] G01F *23/28***
**U.S. Cl. 73—290 V** **2 Claims**




1. A method for detecting the level of liquid within a tank comprising the steps of:

positioning a first ultrasonic transducer within said tank in a given vertical plane at an intersecting horizontal plane coincident with a predetermined level, whereby when said liquid is at or above the predetermined level, the liquid immerses a receiving/transmitting face of said first ultrasonic transducer;

positioning a second ultrasonic transducer having a receiving/transmitting face within said tank in a lower horizontal plane and at a different vertical plane relative to the positioning of said first ultrasonic transducer, whereby the receiving/transmitting faces of said first and second ultrasonic transducers are substantially skewed from one another to the extent of their being outside the range of the relative directivity angle of the ultrasonic wave in air, thereby preventing any direct transmission and reception of ultrasonic waves therebetween;

operating one of said first and second ultrasonic transducers as a transmitter for transmitting ultrasonic waves, and the other as a receiver for receiving ultrasonic waves; and

detecting the reception of ultrasonic waves from below the surface of and within said liquid by the one of said first and second ultrasonic transducers operating as a receiver, whereby the detection of ultrasonic waves indicates the liquid is at or above the predetermined level, and the absence of detected waves indicates the liquid is below the predetermined level.

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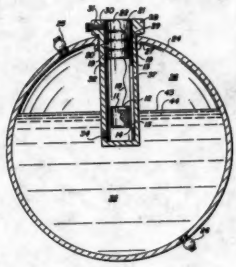
**4,610,165**

## FLUID LEVEL SENSOR

**Dennis M. Duffy, 10038 N. 49th Dr., Glendale, Ariz. 85302, and Gary G. Small, 15701 E. Page, Gilbert, Ariz. 85234**

**Filed Jul. 3, 1985, Ser. No. 752,235**
**Int. Cl.[4] G01F *23/32, 23/36***
**U.S. Cl. 73—317** **6 Claims**



1. In a fluid level sensor for sensing a range of changes in the level of fluid in a vessel; said sensor comprising an inclinometer housed within a stilling basin coupled to a fluid containing vessel and having means for ingress and egress of said fluid to and from said stilling basin, said inclinometer outputting a signal indicative of the fluid level within said stilling basin; the improvement comprising:

an electronics package slidably coupled to and within said stilling basin;

a slide track affixed to said stilling basin;

an inclinometer-bearing-float in fluid contact with the fluid within said stilling basin, said inclinometer being electrically coupled to said electronics package; and

a float support shaft having a first end thereof coupled to said electronics package, a second end thereof pivotally coupled to said float, and the length thereof rigidly, slidably coupled to said slide track,

whereby the slidable adjustment of said electronics package within said stilling basin produces a corresponding adjustment in the fluid contact of said inclinometer-bearing-float with the fluid within said stilling basin to thereby initially set the desired level of fluid in said vessel.

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**4,610,166**

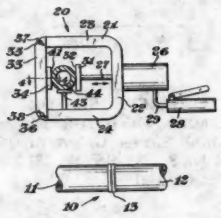
## METHOD AND APPARATUS FOR TESTING WELDS IN PLASTIC PIPE

**Charles D. Elder, and Thomas E. Reder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed May 6, 1985, Ser. No. 732,015**
**Int. Cl.[4] G01N *3/08***
**U.S. Cl. 73—818** **7 Claims**

1. A method for the testing of welds in synthetic resinous thermoplastic flexible pipe, the steps of the method comprising applying radial compressive force in the region of a weld between two pipe sections by using a recessed deforming member in contact with the pipe sections to deform the welded

portion of the pipe sections into a generally oval configuration, detecting while applying radial compressive force, evidence of



a defective weld, subsequently removing a deforming force from the welded pipe sections.

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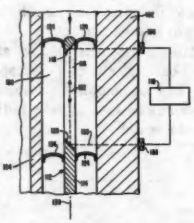
**4,610,167**

## APPARATUS FOR MEASURING FLOW VELOCITY OF FLUIDS

James L. McShane, Churchill Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,815
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.28 28 Claims



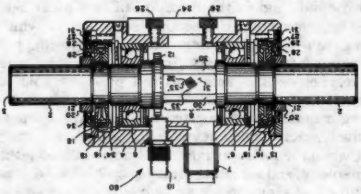
1. An apparatus for measuring the velocity of a fluid flowing within a conduit, said apparatus comprising first and second transducer means arranged on the outer surface of said conduit at spaced-apart locations for transmitting and receiving signals along a signal path within said fluid, said transducer means arranged substantially normal to the outer suface of said conduit and substantially along a common longitudinal axis thereof, and a probe arranged wholly within the interior of said conduit, said probe having a pair of spaced-apart reflecting surfaces arranged along said signal path for reflecting said signals transmitted from said first transducer means to said second transducer means.

**4,610,168**

## VARIABLE MAGNETIC FIELD COUPLING CIRCUIT AND ROTARY TRANSDUCER USING SAME

Paul W. Morgan, Waterford Township, Oakland County, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 722,021, Apr. 11, 1985, abandoned. This application Jun. 17, 1985, Ser. No. 745,173
Int. Cl.[4] H01F *23/00*; G01L *3/10*
U.S. Cl. 73—862.35 7 Claims



1. A magnetic field coupling circuit between relatively fixed and rotary members, said fixed member comprising a pair of adjacently positioned magnetic stator members secured in coaxial relation to the rotary member by means enabling at least one of the stator members to be selectively rotated relative to the other stator member, said stator members having a portion thereof in electrical contacting relationship with each other and a portion of respective facing surfaces thereof spaced axially apart from each other to provide an air gap therebetween having a configuration providing an electro-magnetic field having a reluctance characteristic thereof, a rotor member secured to the rotary member and operative to rotate in unison therewith within the air gap between the stator members, and said stator members having a portion of their respective facing surfaces provided with an asymmetrical configuration adapted such that selective rotation of one of said stator members with respect to the other alters the configuration of the air gap therebetween and thereby alters the reluctance of the magnetic field to provide control of said magnetic coupling circuit.

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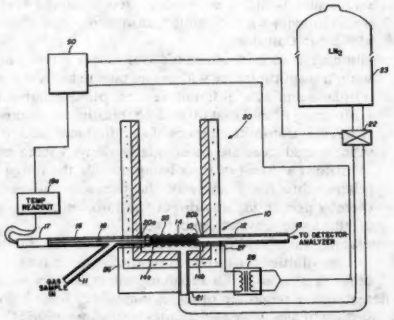
**4,610,169**

## VARIABLE TEMPERATURE TRAP

Cesar Clavell, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1985, Ser. No. 747,220
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—863.12 1 Claim




1. An apparatus responsive to an external presettable control

for enabling a precise analysis of organotins in a gas sample by a detector comprising:

an elongate straight glass tube coupled to receive the gas sample and coupled to the detector for concentrating the organotins therein having a longitudinal chamber containing an absorbent material the straight glass tube is fabricated to withstand temperatures of from −198° C. to 250° C.;

an elongate sensor probe coaxially extending through the longitudinal chamber and the absorbant material of the elongate straight glass tube for providing an indication of temperature;

a reservoir of liquid nitrogen suitably shaped to contain the longitudinal chamber of the elongate straight glass tube therein for lowering the temperature of the longitudinal chamber to −198° C. which is below the levels at which organotins are concentrated, the reservoir having a fitting for allowing the selective filling thereof; and

a helically extending coil laterally disposed about the longitudinal chamber of the elongate straight glass tube for heating it to discrete temperatures up to 250° C. in response to temperature indications from the elongate sensor probe at which discrete temperatures the organotins are eluted from the longitudinal chamber to the detector after the organotins have been concentrated from the gas sample in the longitudinal chamber, wherein the elongate sensor probe, the fitting for the reservoir of liquid nitrogen, and the helically extending coil are coupled to the external control.

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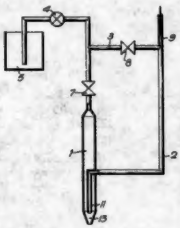
**4,610,170**

## METHOD FOR THE DILUTION OF LIQUID SAMPLES

**Pertti Ekholm, Helsinki, and Esko Kaukanen, Espoo, both of Finland, assignors to Labsystems Oy, Helsinki, Finland**

**Filed Nov. 2, 1984, Ser. No. 667,819**
**Claims priority, application Finland, Nov. 30, 1983, 834387**
**Int. Cl.⁴ G01N *1/14*; B01L *3/02***
**U.S. Cl. 73—864.22** **11 Claims**



1. A method for diluting a sample of liquid comprising the steps of:

accumulating diluent in a diluent conduit so that the interior of said conduit is substantially filled with liquid;

said diluent conduit having a downwardly directed opening at the lower portion thereof,

suctioning a sample into a sample tube whose tip is coaxially aligned with said diluent conduit and arranged concentrically therein;

said tip being arranged at a level above said downwardly directed opening of said diluent conduit,

pumping a predetermined amount of diluent out of said conduit through said downwardly directed opening, and substantially simultaneously with said step of pumping diluent through said downwardly directed opening of said diluent conduit, displacing a predetermined amount of sample out of said sample tube into the stream of diluent issuing through said downwardly directed opening;

said tip of said sample tube having an opening in spaced facing relation with said downwardly directed opening;

whereby the stream of diluent being pumped through said sample conduit promotes mixing of sample and diluent and flows about the periphery of said opening of said sample tube to prevent accumulation of sample thereabout.

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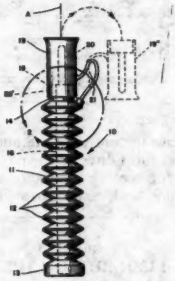
**4,610,171**

## URINANALYSIS VIAL

**Frederic L. Nason, 6830 Orion Ave., Van Nuys, Calif. 91406**

**Filed Apr. 26, 1985, Ser. No. 727,727**
**Int. Cl.⁴ G01N *1/14***
**U.S. Cl. 73—864.62** **8 Claims**



1. A vial for liquid specimens including, in combination:

(a) an elongated elastic bellows having a closed bottom and top neck of generally cylindrical configuration, said bellows being biased to an extended position defining a given volume and capable of being manually collapsed; and

(b) a straw axially positioned in said bellows, an upper portion of said straw being circumferentially frictionally engaged by said neck, said straw being substantially contained within said bellows when said bellows is in the extended position, whereby said bellows is axially guided by said straw when said bellows is collapsed with said straw thereupon being frictionally urged through said neck such that the upper end of said straw projects substantially from said bellows, said straw further functioning as a passage for transferring a liquid specimen by suction into said bellows upon manual release of the bellows.

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**4,610,172**

## INDUCTION FEEDBACK STABILIZED SUSPENSION GYROSCOPE

**Marlin H. Mickle, and Yuly M. Pulyer, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.**

**Filed Nov. 4, 1982, Ser. No. 439,038**
**Int. Cl.⁴ G01C *19/08, 19/24, 19/28, 19/30***
**U.S. Cl. 74—5.46** **27 Claims**

1. A suspension gyroscope comprising,

a stator,

a rotor rotatably mounted on said stator,

means for initiating rotation and levitation of said rotor with respect to said stator,

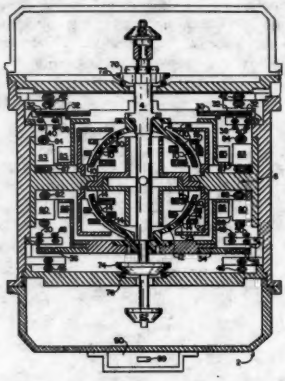
said rotor having at least one generally hemispherical portion at least parts of which are electrically conductive,

first electrical coil means for generating magnetic fields to induce eddy currents in said hemispherical portions,

said first electrical coil means having coils adapted to apply a levitation force in a first direction to a first said hemispherical portion,

said rotor having disc means which are at least partially electrically conductive,

second electrical coil means for inducing eddy currents in



said disc means to control positioning of said rotor means in second and third directions, and

sensor means for sensing departure of said rotor from a desired position with respect to said stator.

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**4,610,173**

**PUSH-BUTTON TUNER**

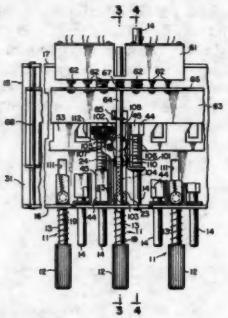
**Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 15, 1984, Ser. No. 660,932**

**Claims priority, application Japan, Oct. 17, 1983, 58-192599**

**Int. Cl.[4] H03J *5/12***

**U.S. Cl. 74—10.33** **4 Claims**



**1.** A push-button tuner comprising:

a support, tuning means mounted on said support in a manner so that said tuning means is movable to positions corresponding to tuned frequencies for producing the tuned frequencies, and a plurality of presettable tuning mechanisms for adjusting said tuning means to move selectively to positions respectively corresponding to specific frequencies, in which each of said tuning mechanisms comprises:

a rotatable operation member movable between a front non-actuation position and a rear actuation position, said operation member being normally urged to said front non-actuation position, said operation member having a drive rotary body and a push-button provided at the front end thereof, said push-button defining at its front end a rotating knob for effecting rotation of said operation member; and

a rotatable tuning member having a driven rotary body for selectively engaging with said drive rotary body to rotate together with said drive rotary body, said rotatable tuning member being supported by said support in a manner so that said rotatable tuning member is normally urged to said front non-actuation position while it is movable between said front non-actuation position and said rear actuation position, said rotatable tuning member having a longitudinally extending threaded portion and a tuning piece threadedly engaged with said threaded portion, said tuning piece being movable in the frontward and rearward directions in response to and according to the direction of rotation of said tuning member;

said tuning means including an actuator plate engaging with said tuning piece of each said tuning member when the same is in said rear actuation position to enable adjusting of said tuning means, and variable tuning elements provided on said actuator plate; and

said push-button tuner further comprising locking means including a lock member for holding any one of said tuning members so as to permit the transmission of rotation between said drive rotary body and said driven rotary body when said one tuning member is located in said rear actuation position and for releasing said one tuning member held in said rear actuation position when another tuning member is displaced to said rear actuation position, and restriction means for restricting further rearward movement of said operation member when said one tuning member is moved rearward by said operation member and has reached a position where said tuning member is held by said lock member.

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**4,610,174**

**TRANSMISSION FOR A TRACTOR**

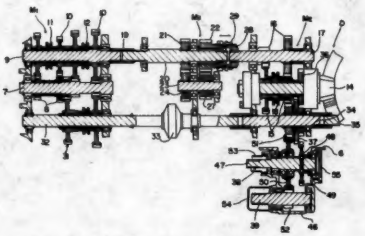
**Masao Takagi, Hashimoto, and Mitsuo Watashi, Sakai, both of Japan, assignors to Kubota, Ltd., Osaka, Japan**

**Filed Aug. 22, 1984, Ser. No. 643,229**

**Claims priority, application Japan, Dec. 20, 1983, 58-196381[U]**

**Int. Cl.[4] F16H *37/00***

**U.S. Cl. 74—15.2** **9 Claims**



**1.** A transmission for a tractor having front and rear wheels comprising:

an input shaft operatively connected to an engine;

running-travel shaft means operatively connected between said input shaft and a rear wheel drive shaft for driving the rear wheels of said tractor, said running-travel shaft means including a main change speed means;

PTO shaft means operatively connected to said input shaft and including a PTO counter shaft;

a first gear rotatably mounted on said PTO counter shaft and operatively connected to said rear wheel drive shaft;

front wheel drive shaft means disposed below said PTO counter shaft and including a second gear rotatably mounted thereon, said front wheel drive shaft means being

adapted to be operatively connectable to said rear wheel drive shaft through said first gear;

a mid-PTO shaft disposed below said front wheel drive shaft means and operatively connected to said PTO counter shaft through said second gear.

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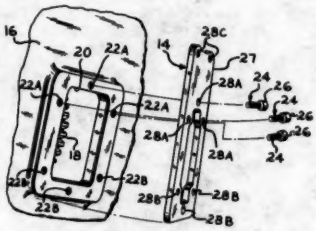
**4,610,175**

## POWER TAKEOFF ASSEMBLY

**Philip J. Weis, Sylvania, Ohio, and Richard A. Cook, Gregory, Mich., assignors to Dana Corporation, Toledo, Ohio**

**Filed Feb. 6, 1984, Ser. No. 577,436**
**Int. Cl.[4] F16H *37/00, 57/02***
**U.S. Cl. 74—15.86** **7 Claims**




1. In an adaptor plate assembly for interfacing a power takeoff unit with a transmission, said power takeoff having a plurality of first openings and a plurality of second openings for receiving securement means, said transmission having a housing, said housing having an opening for operatively receiving said power takeoff unit, a plurality of apertures positioned around said opening in said housing, the improvement comprising:

an adaptor plate for positioning intermediate said power takeoff unit and said housing, said adaptor plate having a plurality of first passageways in alignment with said apertures in said housing, said adaptor plate having a plurality of second passageways in alignment with said second openings in said power takeoff unit, a plurality of guide and support means having an outwardly extending portion positioned in a portion of said passageways, said outwardly extending portion of said guide and support means aligning and supporting said power takeoff unit adjacent said adaptor plate, securement means positioned in ones of said first and second openings in said power takeoff unit, whereby said securement means rigidly secure said power takeoff unit and said adaptor plate to said housing.

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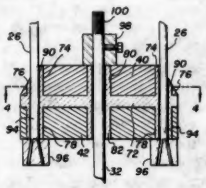
**4,610,176**

## METHOD AND APPARATUS FOR ISOLATING WELL PUMP UNITS

**Ernest A. Schmidt, and Donald M. Schmidt, both of R.R. 1, Box 145 B3, Williston, N. Dak. 58801**

**Filed Jul. 5, 1983, Ser. No. 510,941**
**Int. Cl.[4] H01B *17/00***
**U.S. Cl. 74—108** **20 Claims**




1. In a well pump unit wherein a well is provided with a polish rod and the pump unit includes at least one draw cable adapted to reciprocate said polish rod, a method for increasing the life of mechanical parts of the pump unit by eliminating electrical pitting in said pump unit, comprising the steps of:

providing a carrier bar operative to interconnect the at least one draw cable and the polish rod wherein said carrier bar is split into first and second bar segments, each of said first and second bar segments having similarly dimensioned facing surface and complimentary and opposed cable bores adapted to receive said draw cable and having complimentary and opposed rod bores adapted to receive said polish rod;

electrically isolating said polish rod from said draw cable by positioning first insulating material between said first and second bar segments completely across the area between said facing surfaces to prohibit electrical contact therebetween and by positioning second insulating material in said cable bores and said rod bores in such orientation whereby said draw cable is prevented from contacting said first and second bar segments, said polish rod is prevented from contacting said first and second bar segments; and

mounting said draw cable and said polish rod to said carrier bar whereby the force exerted on the carrier bar by said draw cable and polish rod is uniformly distributed across the first insulating material between the bar segments.

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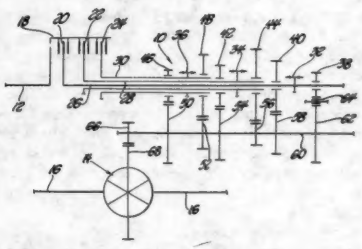
**4,610,177**

## PRESELECTED MULTIRATIO TRANSMISSION

**John E. Mahoney, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Feb. 25, 1985, Ser. No. 705,206**
**Int. Cl.[4] F16H *3/08***
**U.S. Cl. 74—330** **1 Claim**



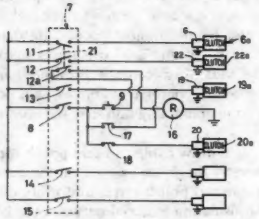

1. A multistep ratio power transmission comprising a drive shaft; a driven shaft; three selectively engageable friction clutch means operatively connected with said drive shaft; three transmission input shafts each connected with respecive friction clutch means; three synchronizer clutch means connected with respective ones of said three transmission input shafts; a plurality of gear train means operatively connected with said output shaft for selectively providing a plurality of forward step ratios and a reverse ratio including two ratio gears on each transmission input shaft and being selectively connectible therewith by respective ones of the synchronizer clutch means, and an output ratio gear meshing with each ratio gear; and each of said synchronizer clutch means being operable to selectively connect a pair of gear train means with the respective friction clutch means, at least two of said pairs of gear train means providing forward drive ratio with each pair controlled by the same synchronizer clutch means providing forward drive ratios which are separated by three ratio steps.

4,610,178

## SPEED CHANGER FOR VEHICLES USED IN CONSTRUCTION WORK

Ryutaro Kameshita, Ishioka, Japan, assignor to Toyo Unpanki Co., Ltd., Japan

Filed Jun. 27, 1984, Ser. No. 625,307
Int. Cl.[4] B60K *20/10*
U.S. Cl. 74—335 2 Claims



1. A speed changer for changing a speed change gear of a tractor shovel, comprising:

a first speed solenoid valve means for actuating a first speed clutch adapted to be connected to said speed change gear;

a second speed solenoid valve for actuating a second speed clutch adapted to be connected to said speed change gear;

a switch unit, said unit including a first speed switch operably connected to said first speed solenoid valve for activating and deactivating said first speed solenoid valve, a second speed switch operably connected to said second speed solenoid valve for activating and deactivating said second speed solenoid valve, a triple pole single throw switch comprising a reverse switch, a forward switch and an interlock switch, all three of which are interconnected by an interlocking mechanism, said interlock switch being closed when said forward switch is closed and said reverse switch is open and said interlock switch being open when said forward switch is open and said reverse switch is closed;

a relay, connected between said second speed switch and said second speed solenoid valve, having an A contact and a B contact, said relay being operably connected to said interlocking switch, said A contact being operably connected to said first speed solenoid, said B contact being operably connected to said second speed solenoid, said B contact being closed and said A contact being open when said relay is deenergized and said A contact being closed and said B contact being open when said relay is energized; and to

a changeover switch operably connected to said interlocking switch and said relay, said changeover switch operable to energize said relay when said changeover switch is closed and operable to deenergize said relay when said changeover switch is open;

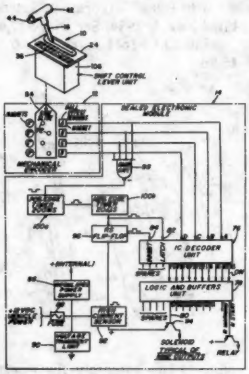
whereby the forward speed of a tractor shovel can be changed from a second speed to a first speed by closing a single changeover switch even though the second speed switch of said switch unit is closed and said first speed switch of said switch unit is open.

4,610,179

## MANUAL SHIFT CONTROL LEVER DEVICE AND SELF-CONTAINED ELECTRONIC CONTROL FOR TRANSMISSIONS

Francis F. Parker, Santa Ana, Calif., assignor to Peter D. Adams, Industry, Calif., a part interest

Filed Sep. 7, 1984, Ser. No. 648,179
Int. Cl.[4] G05G *9/00*; B60K *20/16*; H01H *36/00*
U.S. Cl. 74—335 25 Claims



1. A unitized shift control lever device for the remote activation of an electrically controlled transmission comprising:

a housing;

a manually operable range selector lever pivotally supported in said housing for selective movements to predetermined operating positions respectively indicative of a required operating condition of an associated electrically controlled transmission;

means in said housing providing a source of radiations;

radiation controlled switching means for generating discrete control signals in response to the presence and non-presence of said radiations;

means interposed in the radiation path between said source and said switching means operable in response to the movement of said range selector lever for selectively determining the presence or non-presence of said radiations with respect to said switching means at each range selector position of said lever; and

electronic circuit control means having input connections for receiving said generated signals and output connections adapted for connection with electrically activated condition controlling devices on the transmission.

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4,610,180

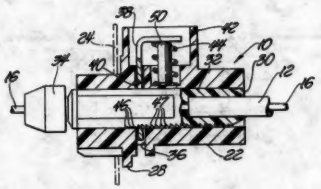
## MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY—INITIAL REDUCED RESISTANCE SELF-ADJUST

Arthur L. Spease, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Nov. 28, 1984, Ser. No. 675,639
Int. Cl.[4] F16C *1/22*
U.S. Cl. 74—501 P 8 Claims

1. A motion transmitting remote control assembly (**10**) of the type for transmitting motion along a curved path by a flexible motion transmitting core element (**16**), said assembly comprising; a flexible conduit (**12**) having opposite ends; a flexible motion transmitting core element (**16**) movably supported by said conduit (**12**) with the ends thereof extending from the ends of said conduit, a support member (**22**), locking means (**38**) engageable with said conduit for controlling the longitudinal movement thereof relative to said support member, biasing means (**44**) reacting between said support member (**22**) and said

locking means (38) for urging said locking means into engagement with said conduit while allowing said locking means to be moved out of engagement with said conduit in response to a predetermined force, coacting means (46, 47, 48) disposed on said locking means (30) and said conduit (12, 32) respectively for automatically allowing said conduit (12, 32) to move longitudinally relative to said support member (22) in response to a predetermined longitudinal force applied to said conduit through said core element (16) whereby the distance said core element (16) extends from said conduit is adjusted, said assembly characterized by said coacting means including a first plurality of teeth (46) for providing a first degree of resistance to initial longitudinal movement of said conduit and a second plurality of teeth (47) having a different configuration then said first plurality of teeth (46) for providing a greater second degree of resistance to subsequent longitudinal movement of said conduit so that a lesser force applied to said core element is required for a predetermined length of initial movement of said conduit relative to said support member than the greater force applied to said core element required for such relative movement after the initial predetermined length of movement.



## 4,610,181

## POWER TRANSMISSION DEVICE FOR STARTING IN FORWARD OR REVERSE

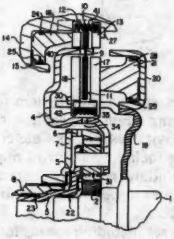
**Daniel Houley, Colombes, and Patrice Baudoin, L'Etang la Ville, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France**

**Filed May 7, 1984, Ser. No. 607,501**

**Claims priority, application France, May 6, 1983, 83 07651**

**Int. Cl.[4] F16H *3/44, 57/10*; F16D *11/06***

**U.S. Cl. 74—792** **10 Claims**



1. A power transmission device comprising:
a fixing housing;
an input shaft connectable to a source of power;
an output shaft;
a sun gear rotatable with said input shaft;
a ring gear rotatable with said output shaft;
at least one pinion gear meshing with said sun and ring gears;
a pinion carrier upon which said at least one pinion gear is mounted;
a brake disc having friction linings on two sides thereof and mounted on said pinion carrier;
a clutch disc parallel with said brake disc and having friction linings on two sides thereof and mounted on said pinion carrier;
nonrotatable brake friction linings mounted on said housing on two sides of said brake disc;
clutch friction linings mounted for rotation with one of said input and output shafts;
a brake cylinder in said housing and having a piston engaging one of said brake friction linings on one side of said brake disc;
a clutch cylinder rotatable with said one of said input and output shafts and having a piston engaging one of said clutch friction linings on side of said clutch disc opposite said one side of said brake disc; and
spring means for biasing apart said brake friction linings and clutch friction linings,
whereby said discs are centered between said lining and parasitic drag is reduced.

## 4,610,182

## PLANETARY GEAR ARRANGED IN A GEAR HOUSING BETWEEN A JET ENGINE AND AN ELECTRICAL ENGINE

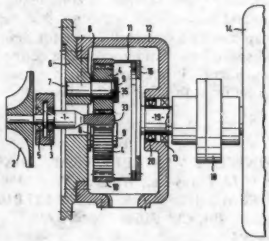
**Günther Heidrich, Ortwang, Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-Hutten -und Salzwerk AG, Munich, Fed. Rep. of Germany**

**Filed Feb. 9, 1984, Ser. No. 578,532**

**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 3311310**

**Int. Cl.[4] F16H *1/28***

**U.S. Cl. 74—801** **5 Claims**

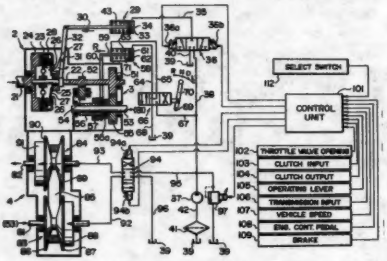


1. A planetary gear transmission mounted in a gear housing between a jet engine having a high speed impeller shaft and an electric generator having a slow speed shaft comprising, a sun gear fixed on said impeller shaft, a stationary planet carrier, a plurality of planet gears, each planet gear being mounted for rotation on a bearing pin fixed to said carrier, said planet gears being arranged around said sun gear and in mesh therewith, and a hollow wheel ring gear having internal teeth arranged around said planet gears and in mesh therewith, said ring gear having a thin-walled annular extension connected to said slow speed shaft for imparting motion thereto and to provide a predetermined amount of radial elasticity, said sun gear and planet gears together defining a bearing for the impeller shaft and said hollow wheel ring gear serving as a supporting bearing for said slow speed shaft, and additional bearing means in said gear housing for said slow speed shaft.

## 4,610,183
## CONTROL OF A STEPLESSLY VARIABLE VEHICLE TRANSMISSION

**Kazutoshi Nobumoto, and Shizuo Sumida, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Oct. 31, 1984, Ser. No. 666,666**
**Claims priority, application Japan, Oct. 31, 1983, 58-202515; Oct. 31, 1983, 58-202516; Oct. 31, 1983, 58-202517**
**Int. Cl.[4] B60K *41/12***
**U.S. Cl. 74—866** **10 Claims**




1. A steplessly variable transmission device comprising steplessly variable power transmission means including an input means adapted to be driven by engine means, an output means, and a variable speed ratio means between said input and output means for steplessly changing a speed ratio between said input and output means, actuator means for actuating the variable speed ratio means for obtaining a desired value of said speed ratio, control means responsive to an operating condition of the engine means to produce an output signal in accordance with speed ratio control characteristics having a shift-up zone, a shift-down zone and a speed ratio hold zone for controlling the actuator means so that a desired value of the speed ratio is obtained, said shift-up zone, said shift-down zone and said speed ratio hold zone being determined as functions of load on said engine means and a speed related to the speed of said engine means, said speed ratio hold zone being between said shift-off zone and said shift-down zone, said zones being defined by a map having a first shift curve for defining the shift-up zone, said speed ratio hold zone being defined by said first shift curve and a second shift curve which is spaced toward the shift down zone from the first shift curve.

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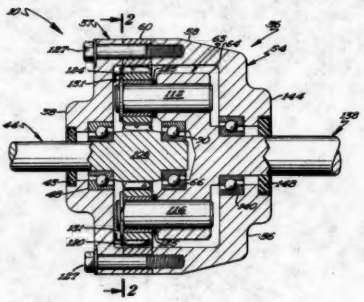
## 4,610,184
## INFINITELY VARIABLE TRANSMISSION

**Paul Taylor, 907A Lotus La., Wausau, Wis. 54401**

**Filed Jul. 25, 1983, Ser. No. 517,016**
**Int. Cl.[4] F16H *3/44, 57/10***
**U.S. Cl. 74—794** **9 Claims**

1. Infinitely variable transmission having no external controls comprising, in combination: a rotatable input; a rotatable output, with the input and output lying along and being dynamically balanced along a transmission axis; a power housing having an interior; means for rotatably mounting the power housing on the input about the transmission axis; means for rotatably mounting the power housing on the output about the transmission axis, with the power housing being dynamically balanced along the transmission axis; a drive gear located in the interior of the power housing and operatively attached to the input along the transmission axis; at least a first, planetary gear located in the interior of the power housing and operatively attached to the output along a planetary gear axis which is parallel to but spaced from the transmission axis, with the planetary gear being in gearing relation with the drive gear; a ring gear located in the interior of and operatively attached to the power housing along the transmission axis, with the ring gear being in gearing relation with the planetary gear; a lubricant having a viscosity located in the interior of the power housing, with the transmission having an internal resistance created by the drag and friction of the drive, planetary, and ring gears gearing together and the viscosity of the lubricant for influencing the rotation and acceleration of the output,



wherein if the load is sufficient, the power housing will rotate in a direction opposite to the direction of the input and output when the output is initially accelerated and will cease rotation and begin rotating in the same direction as the direction of the input and output as the output is further accelerated.

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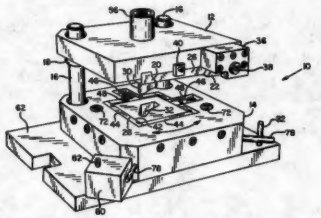
## 4,610,185
## ROTATABLE MASTER DIE SET AND QUICK CHANGE UNIT DIE SYSTEM

**Daniel E. France, 8010 NW. 1st Ave., Vancouver, Wash. 98665**

**Filed Apr. 26, 1984, Ser. No. 604,147**
**Int. Cl.[4] B23D *65/02;* B26F *1/06***
**U.S. Cl. 76—29** **18 Claims**



1. A master die set and unit die system for use in a punch press of the type having a ram moveable with respect to a bed for moving a punch with respect to a die comprising:

(a) a master die set including a pair of opposed shoes;

(b) said shoes including respective attachment means for attaching said shoes respectively to said ram and said bed of said punch press;

(c) said master die set including means interconnecting said shoes for preventing all relative movement between said shoes except movement parallel to the movement of said ram;

(d) a unit die including unit die blank means for arranging a die thereon and unit punch holder means for mounting a punch;

(e) said unit die blank means and said unit punch holder means having predetermined dimensions;

(f) said shoes including respective receptacle means for receiving said unit die blank means and said unit punch holder means;

(g) each of said receptacle means including a floor and further including a pair of alignment surfaces, perpendicular to each other and substantially adjacent to each other;

(h) said receptacle means including respective operable clamping means for selectively forcing said unit die blank means and said punch holder means against said respective alignment surfaces of said respective receptacle means and aligning said unit die blank means and said unit punch holder means in registry with each other; and

(i) said respective clamping means being operable to reiteratively clamp said unit die blank means and said unit punch holder means in registry with one another while said shoes are operatively attached to said punch press.

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**4,610,186**

**CUTTING INSERT FOR THREAD CUTTING**

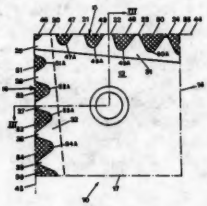
**Erik Schmidt, Ludvika, Sweden, assignor to Seco Tools AB, Fagersta, Sweden**

**Division of Ser. No. 580,750, Feb. 16, 1984, Pat. No. 4,572,713. This application Jan. 6, 1986, Ser. No. 816,331**

**Claims priority, application Sweden, Feb. 21, 1983, 8300933**

**Int. Cl.[4] B23G *5/00***

**U.S. Cl. 76—101 R** **3 Claims**



1. A method of making a thread cutting insert of the type comprising parallel first and second side surfaces and at least four edge surfaces extending therebetween, first and second ones of said edge surfaces intersecting and defining first supporting edges adapted to rest against supporting surface means on an insert-carrier, third and fourth ones of said edge surfaces intersecting at a corner of the insert and provided with cutting teeth, a rake face for the cutting teeth on said third edge surface being provided on said first side surface and a rake face for the cutting teeth on said fourth edge surface being provided on said second side surface so that the cutting teeth on the one of said third and fourth edge surfaces which is inactive during cutting by means of the other of said third and fourth edge surfaces can be brought into cutting position by turning the cutting insert about an imaginary symmetry line which bisects an angle formed by said third and fourth edge surfaces, said teeth on each said third and fourth edge surface being separated by recesses which become progressively deeper as said recesses become more remote from said corner, said method including the step of:

removing material from two intersecting edge surfaces of a blank to form said recesses of said third and fourth edge surfaces, said material being removed so as to form said recesses with bottoms which become located progressively closer to the opposing one of said supporting edges as said recesses become more remote from said corner.

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**4,610,187**

**TOOL FOR APPLYING AND REMOVING A SPRING CLAMP**

**George E. Spaulding, Woodridge, Ill., assignor to Wittek Industries, Inc., Broadview, Ill.**

**Filed Nov. 22, 1985, Ser. No. 800,678**

**Int. Cl.[4] B25B *27/00***

**U.S. Cl. 81—9.3** **1 Claim**

1. In combination with an openable spring clamp of circular configuration and having a radially outwardly extending latch at one end and a latch hook at the other end, said latch hook having a radially outwardly extending portion, a circumferentially extending portion and a radially inwardly and reentrantly folded portion,

a tool for closing and opening said spring clamp comprising:

a pair of handles,

a pin joining said handles for relative rotation,

a pair of jaws on said handles, respectively, each of said jaws having a radially outer surface extending generally concentrically with the axis of rotation thereof about said pin, one of said jaws having an end portion that is relatively thin in radial dimension as related to the axis of rotation thereof and the other of said jaws having an end portion that is relatively thick in radial dimension as related, to the

axis of rotation thereof, the thin end portion on said one jaw being engagable with the latch on said clamp and the thick end portion on said other jaw being engagable with the radially outwardly extending portion of the latch hook on said clamp whereby rotation of said jaws toward one another effects closure of said clamp, the thick end portion on the other of said jaws having a concave section on the radially inner face thereof engageable with the radially inwardly extending portion of the latch hook on said clamp upon reversal of said tool relative to said clamp thereby to cam said latch hook radially outwardly relative to said latch whereby said tool is reversible to effect both closure and opening of said spring clamp.

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**4,610,188**

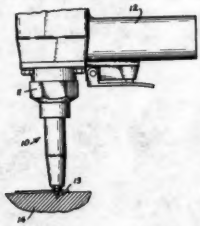
**MAGNETIC DRIVING TOOL**

**Peter Hallock, 234 Seaview Ave., Swansea, Mass. 02777**

**Filed Feb. 24, 1983, Ser. No. 469,339**

**Int. Cl.[4] B25D *1/04***

**U.S. Cl. 81—24** **6 Claims**



1. A magnetic hammer tool for attracting the head of a metallic fastener during driving comprising a shank having a mounting portion and a driving end portion, said driving end portion having first and second impacting segments, said first and second impacting segments having generally planar impact surfaces, a pair of oppositely disposed grooves partially separating said first and second impacting segments and extending from said impact surfaces along a portion of the length of said driving end portion, a bridge section defined between said grooves integrally connecting said first and second im-

pacting segments, said bridge section having an impact surface which is generally coextensive with said first and second impact surfaces of said first and second impacting segments, the material of said first and second impacting segments of said tool being magnetized having opposite polarities, whereby the impacting surface of the tool will retain metallic fasteners during the use of the tool.

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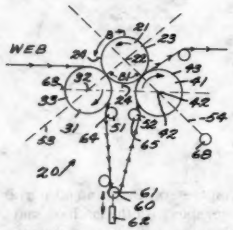
**4,610,189**

## WEB PERFORATING UTILIZING A SINGLE PERF CYLINDER AND DUAL ANVILS

**Leo Lombardo, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.**

**Filed Jul. 11, 1985, Ser. No. 753,900**
**Int. Cl.[4] B26F *1/20, 1/24***
**U.S. Cl. 83—30** **20 Claims**




**16**. A method of perforating a paper web in the production of business forms and the like, utilizing a perforating cylinder having a periphery with web-perforating elements operatively extending therefrom, and first and second anvil rollers mounted in operative relationship with the perforating cylinder, comprising the steps of continuously:

(a) passing the web between the peripheries of the first anvil and the perforating cylinder to form a first series of perforations along the paper web; and

(b) passing the paper web from the first anvil cylinder to between the peripheries of the second anvil cylinder and the perforating cylinder so as to form a second series of perforations in the paper web spaced a predetermined desired distance from the first set of perforations.

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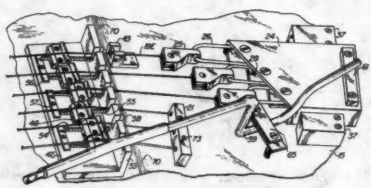
**4,610,190**

## PITCH RAISING SYSTEM FOR GUITARS

**Terrance R. Maloney, 607 W. Springfield, Champaign, Ill. 61820**

**Filed Oct. 22, 1984, Ser. No. 663,182**
**Int. Cl.[4] G10D *3/12***
**U.S. Cl. 84—312 R** **7 Claims**



**1**. A pitch altering device for a stringed musical instrument having a bridge and a plurality of strings, said pitch altering device comprising:

a pivoting structure pivotally secured to said instrument rearward of said bridge about a pivot axis disposed transverse to said strings;

means for attaching a plurality of strings to said pivoting structure, said attached strings being the primary agent determining the resting position of said pivoting structure, the points of attachment lying in a plane passing through said axis and being spaced from said axis in the direction of the respective string's length when said string is tensioned on said instrument such that the relative tuning of the attached strings is substantially maintained when said pivoting structure is pivoted about said axis, said attaching means and said pivoting structure rigidly maintaining said plane during pivoting; and

means for pivoting said pivoting structure about said axis to alter the tension of the attached strings simultaneously.

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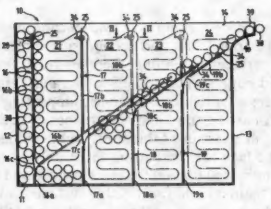
**4,610,191**

## AMMUNITION CONTAINER FOR BELTED CARTRIDGES

**Samuel Schmid, Dietlikon, and Hans-Peter Novet, Volketswil, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland**

**Filed Oct. 26, 1984, Ser. No. 665,531**
**Claims priority, application Switzerland, Nov. 4, 1983, 5955/83**
**Int. Cl.[4] F41D *10/14***
**U.S. Cl. 89—34** **3 Claims**



**1**. An ammunition container for belted cartridges, comprising:

a base member and a predetermined number of side walls;

a discharge opening for the belted cartridges provided in one of said side walls in an upper end region thereof;

a predetermined number of pivotable partition walls subdividing said ammunition container into a predetermined number of compartments;

each said pivotable partition wall comprising:

a stationary rigid partition wall portion;

a pivotable resilient partition wall portion pivotable toward said discharge opening;

a spring plate interconnecting said stationary rigid partition wall portion and said pivotable resilient partition wall portion;

each one of said spring plates being arranged at a predetermined distance from said base member of the ammunition container;

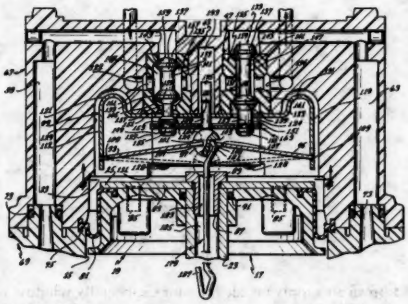
said predetermined distances of said spring plates from said base member of the ammunition container continually increasing from one pivotable partition wall to a subsequent pivotable partition wall in a direction towards said discharge opening; and

means for locking said pivotable partition wall portion in an upright position and being operated by one of said belted cartridges to release said pivotable partition wall portion.

## 4,610,192
## RECIPROCABLE DEVICE

E. Dale Hartley, Malibu, and F. Scott Hartley, Camarillo, both of Calif., assignors to Product Research and Development, Anaheim, Calif.

Continuation-in-part of Ser. No. 443,589, Nov. 22, 1982. This application May 23, 1984, Ser. No. 613,867
Int. Cl.[4] F01L *31/02*
U.S. Cl. 91—341 R 20 Claims



1. A reciprocable device comprising:
a housing having a chamber therein;
a reciprocable member in the chamber and having first and second faces exposable to a driving fluid under pressure to reciprocate the reciprocable member in the chamber;
valve means in said housing including first and second valve elements movable in the same general direction along laterally spaced paths for controlling the supply and exhaust of the driving fluid under pressure to and from the first and second faces whereby the reciprocable member can be reciprocated in said chamber;
a connector extending between and joining the valve elements whereby the connector and valve elements are movable together;
bistable spring means in said housing having first and second states and a neutral position for driving the connector whereby the valve elements are moved to control the supply and exhaust of the driving fluid under pressure to and from the first and second faces, said bistable spring means including first and second levers, a hinge member between said levers and spring means for urging the first and second levers toward the hinge member;
said spring means including a spring bracket having first and second legs drivingly coupled to the first and second levers, respectively, and a web joining said legs, said connector being between the hinge member and at least a portion of said web; and
means for drivingly coupling the reciprocable member and the bistable spring means so that said reciprocable member can operate the bistable spring means.

10. A reciprocable device comprising:
wall means defining a chamber;
a reciprocable member in the chamber and having first and second faces exposable to a driving fluid under pressure to reciprocate the reciprocable member in the chamber;
valve means including first and second movable valve elements for controlling the supply and exhaust of the driving fluid under pressure to and from the first and second faces whereby the reciprocable member can be reciprocated in said chamber;
a connector for drivingly coupling the first and second valve elements whereby the connector and the valve elements are movable together;
bistable spring means having first and second states and a neutral position between said states thereof for at least assisting in driving the connector, said bistable spring means including first and second levers, a movable hinge member between said levers and spring means for urging the first and second levers toward the hinge member, said hinge member being interposed between the connector and the reciprocable member and engaging the connector to drive the connector in at least one direction;
means for drivingly coupling the reciprocable member and the bistable spring means so that said reciprocable member can move the bistable spring means from one of its states through the neutral position with the resilience of the bistable spring means at least assisting in moving the bistable spring means from the neutral position toward the other state thereof; and
first means for drivingly coupling the bistable spring means and the connector whereby movement of the bistable spring means to said other state drives the first and second valve elements.

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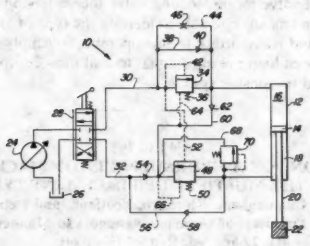
## 4,610,193
## LOAD CONTROL SYSTEM

Gary T. Barker, and James A. Miller, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 26, 1983, Ser. No. 545,567
Int. Cl.[4] F15B *11/02*
U.S. Cl. 91—420 14 Claims



1. A load control system for preventing the uncontrolled lowering of a load should a line failure occur in said system, said load being attached to a piston rod extending out of a hydraulic cylinder, said hydraulic cylinder having a movable piston therein dividing said hydraulic cylinder into a first end and a second end, said system comprising:
(a) a source of pressurized fluid;
(b) control valve means for selectively controlling the flow of pressurized fluid from said source to an end of said hydraulic cylinder; and
(c) first and second valves connected between said control valve means and said first end and said second end, respectively, of said hydraulic cylinder, each of said valves being biased toward a closed position by a common fluid pressure and each of said valves being urged toward an open position by a different common fluid pressure, said valves being sized to open and close in a proportional manner relative to one another with said second valve opening first when said load is to be lowered thereby permitting said load to be lowered in a controlled manner.

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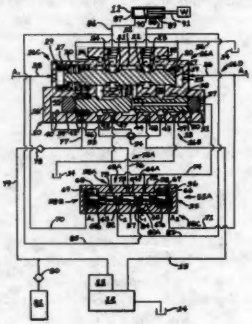
## 4,610,194
## LOAD SENSING CIRCUIT OF LOAD RESPONSIVE DIRECTION CONTROL VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 1, 1985, Ser. No. 707,351
Int. Cl.[4] F15B *13/02*
U.S. Cl. 91—446 28 Claims

1. In a load responsive system including a fluid power actuator operable to control a positive or negative load W, a source of pressure fluid, fluid exhaust means, flow control means of

said load responsive system and first valve means for selectively interconnecting said actuator with said source of pressure fluid and said fluid exhaust means and to direct the flow of fluid subjected to positive type and negative type load pressures, control force generating means responsive to a first and



second control signal and operable to control the position of said first valve means, second valve means having positioning means and means operable to identify the type of load pressure signal, and transmitting means operable to supply said identified type of load pressure signal to flow control means of said load responsive system.

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## 4,610,195

## PISTON FOR A HYDRAULIC PISTON MACHINE OF THE MULTIPLE DISPLACEMENT TYPE

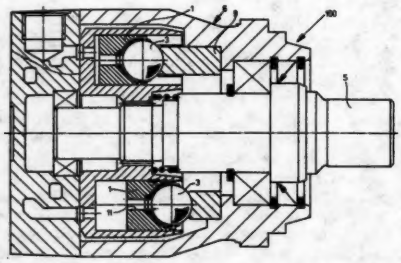
**Sinclair Cunningham, Kinghorn, Scotland, and Peter Wüsthof, Lohr, Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany**

**Filed Jul. 8, 1985, Ser. No. 752,725**

**Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3425015; Aug. 25, 1984, 3431328**

**Int. Cl.[4] F01B *13/06***

**U.S. Cl. 91—488** **9 Claims**



1. A piston for a hydraulic piston machine of the multiple displacement type having a rotor, a cam with multiple cam surfaces and axially extending cylinders comprising:

a piston body reciprocating in each of said cylinders whereby when the rotor is rotated relative to the cam the piston reciprocates in said cylinders, said body having a ball receiving space defined at one end thereof and a recess;

a ball in said ball receiving space;

a bearing dish in said piston ball receiving space formed by a steel support layer, a bronze layer cast onto said steel layer and a plastic layer supporting said ball.

## 4,610,196

## AIR SUPPLY NOZZLE

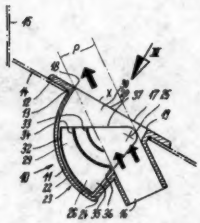
**Alfred Kern, Schneeberg, Fed. Rep. of Germany, assignor to Aurora Konrad G. Schulz GmbH & Co., Mudau, Fed. Rep. of Germany**

**Filed Jan. 30, 1985, Ser. No. 696,360**

**Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403084**

**Int. Cl.[4] B60H *1/00*; F24F *13/04***

**U.S. Cl. 98—2** **3 Claims**



1. In an air supply nozzle for panes, especially window panes and windshields, and for at least one portion of the interior of a vehicle; said nozzle including a housing which has a an air inlet connection, for fresh air and/or recirculated air, and an air outlet opening; said air inlet connection having a predetermined cross-sectional area of air flow, said housing being provided with a swivel damper, which is disposed at least in part between said air inlet connection and said air outlet opening, and being pivotably mounted about a pivot axis which extends essentially parallel to said pane; said swivel damper being provided with at least one curved air deflector which extends essentially in the form of a first circular arc, said swivel damper being movable to a first position for allowing the air flow in essentially the same direction as the direction of air flow in the air inlet connection and being movable to a second position for allowing the air flow in a direction which is transverse to the direction of air flow in the air inlet connection, a flow path being provided between said air inlet connection and said air outlet opening,

the improvement therewith comprising said air deflector, in said first position, being swiveled out of the flow path in such a way that the air flow in said air outlet opening is unhindered and has the full cross-sectional area of said air flow in said air inlet connection, and, in said first position, said flow path being essentially straight; said housing having a housing portion which has the cross-sectional shape of a second circular arc; said second circular arc being coaxial with said first circular arc, said housing portion being formed in such a way that, in said first position, said air deflector is received in said housing portion completely; said swivel damper comprising two sector-shaped end walls which effect said pivot mounting of said swivel damper, and which have free arc-shaped ends remote from said pivot axis; said free ends being interconnected by a continuous peripheral wall, which extends between said ends and is curved concentric to said pivot axis of said swivel damper; said peripheral wall covering an arc having an acute apex angle; said swivel damper being provided with a first curved air deflector, which is disposed between said peripheral wall and said pivot axis, and between said sector-shaped end walls; said first curved air deflector being disposed at such a distance from said pivot axis of said swivel damper, that when the latter is pivoted into said housing portion, said first deflector is disposed beyond said projection of said air inlet connection; said air inlet opening being rectangular; said housing portion, said peripheral wall, and said first curved air deflector being concentrically curved; said swivel

damper being provided with a second curved air deflector, which is disposed between said peripheral wall and said first deflector, and between said sector-shaped end walls; said second deflector, when viewed in cross-section, having essentially the same length as said peripheral wall, but having a different curvature than does the latter; said second deflector and said peripheral wall together defining a channel which, in the direction away from said air inlet connection, tapers in the manner of a nozzle; said first curved air deflector, when viewed in cross-section being considerably shorter than said second curved air deflector; said swivel damper being provided with at least one pivot means aligned with its pivot axis; and including a control member which is seated on said pivot means externally of said housing portion; and means for holding said swivel damper in different pivot positions for supplying air to the interior of said vehicle.

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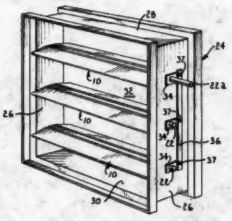
## 4,610,197
## DAMPER BLADE CONSTRUCTION

**Robert M. Van Becelaere, Prairie Village, Kans., assignor to Philips Industrial Components, Inc., Dayton, Ohio**

**Filed Jun. 12, 1985, Ser. No. 744,041**
**Int. Cl.⁴ F24F *13/14***
**U.S. Cl. 98—110** **20 Claims**



1. In a damper blade construction, the improvement comprising:

a hollow airfoil shaped blade having opposite walls formed of sheet material and cooperating to form a central portion of the blade and a pair of generally parallel edges on opposite sides of said central portion, said walls converging toward said edges to provide the blade with a tapered configuration from said central portion toward each edge;

a first pair of stiffening ribs on said central portion of the blade projecting a substantial distance into the blade from one of said walls and formed by corrugations in the sheet material of said one wall, said ribs in the first pair extending substantially the full length of said blade and being spaced apart from one another;

a second pair of stiffening ribs on said central portion of the blade projecting a substantial distance into the blade from the other wall and formed by corrugations in the sheet material of said other wall, said ribs in the second pair extending substantially the full length of said blade and being spaced apart from one another substantially the same distance as the ribs in said first pair;

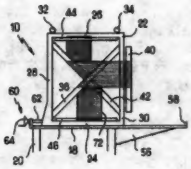
a channel extending through said central portion of the blade and having opposite ends on opposite ends of the blade, located between the ribs in said first and second pairs; and

a pair of stub axles extending into said opposite ends of said channel in contact with each rib in said first and second pairs to provide a damper axis, said axles being embraced by said ribs and being rigidly secured to each of said ribs to effect turning of the blade about said damper axis in response to turning of the axles.

## 4,610,198
## DEVICE FOR TURNING PAPER IN VERSO-RECTO PRINTING

**Flaujac Raymond, Creteil, France, assignor to Seailles & Tison SA, Vendome, France**

**Filed Dec. 24, 1984, Ser. No. 685,268**
**Claims priority, application France, Jan. 3, 1984, 84 00028**
**Int. Cl.⁴ B41F *5/04*; B65H *23/32***
**U.S. Cl. 101—223** **5 Claims**



1. In a device for turning paper in verso-recto printing, adapted to be arranged on the paper advance path between two printing stations and having an assembly of turning bars which are angularly staggered with each other, the improvement comprising:

a fixed support forming a horizontal slide and extending perpendicularly to the said paper path, and

an upright removable body supporting said assembly of turning bars and adapted to be adjusted in position and fixed in said support,

wherein said slide of said support has a section in the form of an inverted T and the body is provided at its lower part with:

at least two studs each displaceable vertically, and

a respective hand grip for vertically displacing said studs for fixing and unfixing said body on said support.

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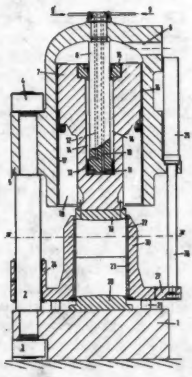
## 4,610,199
## HYDRAULIC PRESS FOR COMPACTING DRUMS CONTAINING RADIO-ACTIVE WASTE

**Pieter M. Pols, Maasland, Netherlands, assignor to Machinefabriek A. Fontijne B.V., Netherlands**

**Filed May 2, 1984, Ser. No. 606,389**
**Claims priority, application Netherlands, May 2, 1983, 8301541**
**Int. Cl.⁴ B30B *1/23, 1/32*; G21F *9/36***
**U.S. Cl. 100—269 R** **2 Claims**



1. A hydraulic press for compacting drums containing radioactive waste, comprising: a press table, a set of vertical support pillars connected at the top to a hydraulic cylinder with a ram

mounted therein, a pressure jacket hydraulically movable in the vertical direction between said ram and said press table along said support pillars, wherein said ram comprises two telescoping plungers, including a double-acting central plunger fixedly connected to said hydraulic cylinder, and an outer plunger freely rotatable about said inner plunger, a lower end of said ram being provided with an annular chamber in which said pressure jacket is receivable in a retracted position.

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**4,610,200**

## ARRANGEMENT IN SILK SCREEN PRINTERS FOR POSITIONING A SECOND PATTERN DERIVING FROM A FIRST PATTERN LOCATED ON A STENCIL IN RELATIONSHIP WITH AN INTENDED LOCATION ON MATERIAL TO BE PRINTED

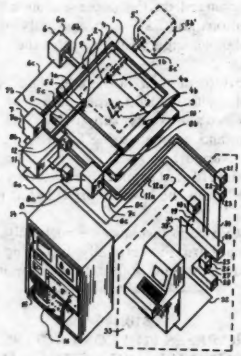
**Matti Metso, Skytteviägen 15., 13400 Gustafsberg, Sweden**

**Filed Oct. 10, 1985, Ser. No. 786,120**

**Claims priority, application Sweden, Oct. 10, 1984, 8405067**

**Int. Cl.[4] B41L** *13/02*

**U.S. Cl. 101—126** **10 Claims**



1. An arrangement in a silkscreen printer for positioning a second pattern deriving from a first pattern provided on a stencil in relation to material to be printed while using a first memory means adapted to store the desired print position of the second pattern in relation to a reference point, the material to be printed being displaceable into a printing station, the said arrangement including means for evaluating the true position of the material in the printing station, and means for evaluating any discrepancy which might occur between the actual and the desired print locations on said material if the second pattern were to be applied thereto with the material in its present position in said station and to evaluate any discrepancy between the actual position and the desired position, the arrangement including further means which, in the event of a discrepancy between said actual and desired print positions, are operative to displace a frame carrying the stencil and/or a printing table and/or the material to a position contingent on the magnitude and directional sense of the discrepancy, or to bring the same to said position in some other way, such that when applying the second pattern to the material, the second pattern is printed in a position on said material in which the previously established discrepancy is fully or satisfactorily compensated, evaluation of the position of the material being made possible with the aid of index marks or part of a previously printed pattern, characterized in that the stencil frame (and/or the material) are arranged for displacement by means of three stepping-motors or like devices; and in that signals corresponding to the evaluated and calculated displacement values for each of the stepping-motors are transmitted thereto so that the pattern, when printed will be located on the material in the position desired with the smallest possible and/or essentially smallest possible deviation form said desired position.

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**4,610,201**

## PRINTING UNIT WITH SHORT INKING DEVICE

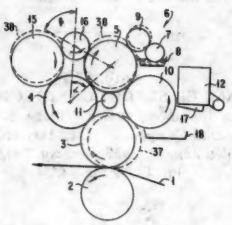
**Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 640,505, Aug. 13, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 804,226**

**Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329331**

**Int. Cl.[4] B41F** *7/02*

**U.S. Cl. 101—217** **2 Claims**



1. Convertible printing unit having impression, blanket and plate cylinders of like diameter, and an inking unit, having an applicator roller for feeding both dampening medium and ink, the applicator roller having a diameter equal to that of the impression, blanket and plate cylinders comprising an inking cylinder engageable with the applicator roller; said inking cylinder having a diameter equal to that of the impression, plate and blanket cylinders and the applicator roller; depending on the position of said blanket cylinder the plate cylinder and said inking cylinder being disposed relative to one another and to the blanket cylinder so that the blanket cylinder is selectively engageable with either the plate cylinder or said inking cylinder depending on the position of said blanket cylinder; the blanket cylinder being selectively coverable by a blanket or a rubber block; the applicator roller being separated from said inking cylinder in a given condition of the printing unit wherein the blanket cylinder is covered by the rubber block and is in direct cooperative engagement with said inking cylinder, the applicator roller and the blanket cylinder, in said given condition, being out of engagement with the plate cylinder.

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**4,610,202**

## INK RESERVOIR

**Ryuichi Ebinuma, Hiratsuka; Yoshifumi Hattori, Yamato, and Hiroo Ichihashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 20, 1984, Ser. No. 684,120**

**Claims priority, application Japan, Dec. 26, 1983, 58-244137**

**Int. Cl.[4] B41F** *31/02*

**U.S. Cl. 101—364** **10 Claims**

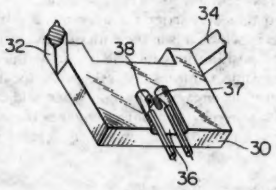
1. An ink reservoir for storing ink to be supplied to a print head, said ink reservoir comprising:

a tank for storing ink to be supplied to the print head;

an ink level measurement area in said tank; and

a sensor for detecting the ink level of the ink stored in said tank, said sensor being arranged outside of said ink level measurement area said tank has a top surface, and wherein a portion of said top surface of said tank has a recess defined therein and a projection is defined rising from said

recess, said projection defining said ink level measurement area, and said tank has a bottom and wherein said ink level




measurement area becomes wider toward said bottom of said tank.

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**4,610,203**

## ELECTRICAL SEQUENTIAL FIRING SYSTEM

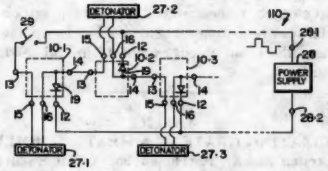
**Immo E. Bock, Randburg, South Africa, assignor to Johannesburg Construction Corporation (Proprietary Limited), Johannesburg, South Africa**

**Filed Oct. 3, 1984, Ser. No. 657,289**

**Claims priority, application South Africa, Oct. 5, 1983, 83/7422; Feb. 28, 1984, 84/1459; Aug. 9, 1984, 84/6195**

**Int. Cl.[4] F42C *11/00***

**U.S. Cl. 102—217** **32 Claims**




**1.** An electrically operable sequential activation module for supplying an activation signal to a device which has a low resistance prior to being activated and a high resistance thereafter, the module being connectable in a series with other similar modules to sequentially activate a number of the devices, the module including

a first convertible element which has two terminals and in its normal first state has a high resistance in at least one direction from its first terminal to its second terminal and which changes to a second state in which it has a low resistance in both directions when a first signal having a predetermined characteristic is applied across the element, the element thereafter having the low resistance value in both directions when the first signal is removed;

a basic power terminal by means of which the module is connectable to an electrical power source for supplying the first signal and an activating signal;

a first and a second device terminal by means of which the device is connectable to the module;

an input steering terminal, and;

an output steering terminal which is connectable to the input steering terminal of a preceding module in a series thereof;

with the first device terminal connected to the input steering terminal;

the second device terminal connected to the output steering terminal;

the second device terminal also being connected to the second terminal of the first element; and

the first terminal of the first element being connected to the basic power terminal.

**4,610,204**

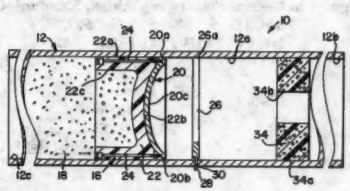
## METHOD AND APPARATUS FOR GENERATING A HIGH-SPEED METALLIC JET

**Brian B. Dunne, 7241 Rue Michael, LaJolla, Calif. 92037, and John M. Walsh, 1599 Camino Medio, Los Alamos, N. Mex. 87544**

**Filed Jun. 25, 1984, Ser. No. 624,214**

**Int. Cl.[4] F42B *11/26***

**U.S. Cl. 102—476** **19 Claims**




**1.** Apparatus for creating a high-speed metallic jet comprising; means defining an elongated barrel having a longitudinal bore opening outwardly of at least one end of said barrel so as to establish a discharge end, a metallic disc of a size enabling said disc to be positioned within said bore so as to lie in a plane substantially perpendiuclar to the longitudinal axis of said bore, means cooperative with said disc and said barrel for releasably supporting said disc within said bore in transverse relation thereto, said support means enabling movement of said disc along said bore when subjected to a predetermined force acting in a direction substantially toward said discharge end, a propellant charge disposed on the upstream side of said disc, and projectile means including an impact plate interposed between said disc and said propellant charge, said impact plate having a concave impact surface facing said disc, said propellant charge and said projectile means being operative in response to actuation of said propellant charge to cause said impact plate to impact said disc with sufficient momentum to create an impact jet and accelerate said jet outwardly of said discharge end while simultaneously causing said jet to collapse into a configuration producing a high velocity elongated metallic jet.

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**4,610,205**

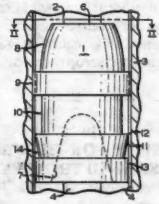
## BULLET FOR BLACK POWDER RIFLES

**John C. Bentley, 128-D Watson Dr., Turtle Creek, Pa. 15145**

**Filed Jul. 30, 1984, Ser. No. 635,733**

**Int. Cl.[4] F42B *9/20, 31/00***

**U.S. Cl. 102—529** **20 Claims**




**1.** A bullet for a rifled bore muzzle loader comprising, as elongated cylindrical body having a front rifling band having a diameter equal to the diameter of the grooves of the rifling, an intermediate cleaning band and a rear expansion band having diameters equal to the diameter of the lands of the rifling, and said elongated cylindrical body having a recessed base which extends into the bullet a distance which encompasses both

intermediate cleaning band and said rear expansion band so that detonation results in the dilation of said intermediate cleaning band and said rear expansion band to clean the rifled bore and to stabilize the bullet.

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**4,610,206**

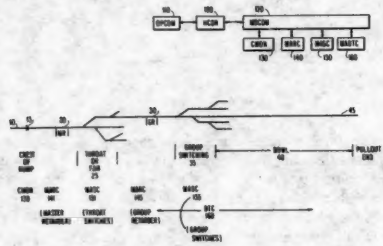
## MICRO CONTROLLED CLASSIFICATION YARD

**Robert Kubala, Arlington; Anthony LaPolla, Carrollton; Donald Raney, and Charles W. Morse, both of Dallas, all of Tex., assignors to General Signal Corporation, Stamford, Conn.**

**Filed Apr. 9, 1984, Ser. No. 597,901**

**Int. Cl.[4] B01B *1/00*; G06F *15/48***

**U.S. Cl. 104—26 B** **32 Claims**



**1.** A control system for a railroad classification yard including a hump track, a master retarder located in said hump track, a plurality of group tracks connected to said hump track by track switches, each said group track including a group retarder, and a plurality of bowl tracks connected to said group tracks by track switches, said control system comprising:

(a) a hump control module including a microprocessor and related peripheral circuits;

(b) an operator communication module coupled to said hump control module, including a microprocessor and related peripheral circuits for transferring information to said hump control module;

(c) a retarder control subsystem including a retarder control module for each of said retarders, each said module including a microprocessor and related peripheral circuits;

(d) a switching control subsystem including a separate switch control module for each group of said track switches, each said module including a microprocessor and related peripheral circuits;

(e) a crest monitor module including a microprocessor and related peripheral circuits for generating information respecting characteristics and performance of a railroad car or cars traversing a crest of said hump;

(f) a communication subsystem comprising a plurality of communication modules for respectively interconnecting said hump control module with said crest monitor module, each of said retarder control modules and each of said switch control modules; each of said communication modules comprising a microprocessor and dedicated communication link.

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**4,610,207**

## POSITIONING DEVICE FOR THE TROLLEYS OF AN ELECTRIC OVERHEAD TROLLEY CONVEYOR

**Georg Uttscheid, Rosenheimer Str. 117, 0-8208 Kolbermoor, Fed. Rep. of Germany**

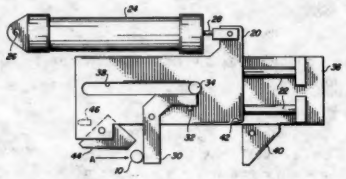
**Filed Nov. 28, 1984, Ser. No. 675,817**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345039**

**Int. Cl.[4] B61K *7/16***

**U.S. Cl. 104—256** **3 Claims**

**1.** A positioning device for stopping movement of an object at a predetermined location comprising a carrier positioned near the path of movement of said object, means supporting said carrier for movement between first and second positions, damping means for resisting movement of said carrier from its first position to its second position and for returning said carrier from its second position to its first position, an engaging member mounted on said carrier for movement between an engaging position in which it is in the path of movement of the object and a free position in which it is out of the path of movement of the object, means for releasably locking said engaging member in its engaging position when said carrier is in its first position whereby said object engages the engaging member and moves said carrier toward its second position



against the resistance of said damping means, said releasable locking means releasing said engaging member to permit movement to its free position as the carrier approaches its second position whereby said carrier is permitted to be returned to its first position by said damping means, a stopping member positioned in the path of movement of said object at the predetermined location, said stopping member being movable out of the path of movement of said object to allow movement of the object to be resumed, and means associated with said carrier for preventing movement of said stopping member out of the path of said object except when said carrier is near its first position.

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**4,610,208**

## VIBRATING GRATE IN A HEATING BOILER

**Bjarne Lersten, and Kjell Svensson, both of Kil, Sweden, assignors to Kils el Ab, Karlstad, Sweden**

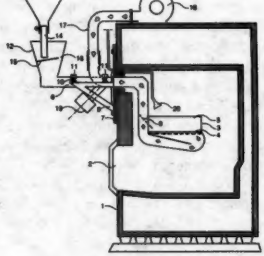
**PCT No. PCT/SE84/00145, § 371 Date Dec. 10, 1984, § 102(e) Date Dec. 10, 1984, PCT Pub. No. WO84/04374, PCT Pub. Date Nov. 8, 1984**

**PCT Filed Apr. 16, 1984, Ser. No. 704,311**

**Claims priority, application Sweden, Apr. 26, 1983, 8302335**

**Int. Cl.[4] F23G *5/30***

**U.S. Cl. 110—244** **6 Claims**



**1.** A means in a heating boiler having a grate onto which fuel material is supplied in particle form from a supply pipe, a vibrating means being arranged to cause the grate to vibrate in order to give the fuel particles a toss movement up from the

grate depending on the oscillation effect produced by the vibrating means said supply pipe being mechanically connected to the grate and arranged to freely support the grate, which is thus freely suspended in the combustion chamber without contact with the bottom or walls of the combustion chamber, said vibrating means being mechanically connected to the supply pipe and arranged to produce a rectilinear movement as well as functioning as a drive source to feed the fuel particles to the grate via the supply pipe, said vibrating means being additionally arranged to continuously impart to the fuel particles a toss movement obliquely upwards and forwards in the supply pipe and on the grate whereby the fuel particles move onto the grate and towards the end of the grate opposite the supply pipe, said supply pipe being resiliently suspended on a front door of the heating boiler by means of cross-stays secured to the supply pipe, brackets secured to the front door, and springs arranged between the cross-stays and brackets.

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**4,610,209**

## GRATE BAR AND GRATE TUMBLER FOR THE TUMBLER GRATE OF, E.G., A TRASH INCINERATION INSTALLATION OR THE LIKE

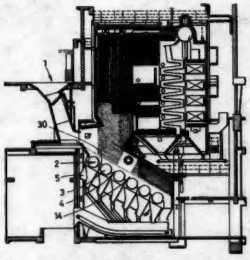
**Sedat Temelli, Erkrath, Fed. Rep. of Germany, assignor to Muellverbrennungsanlage Wuppertal GmbH, Fed. Rep. of Germany**

**Filed Nov. 28, 1984, Ser. No. 675,888**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346747; May 29, 1984, 3420020**

**Int. Cl.⁴ F23K *3/18***

**U.S. Cl. 110—276** **12 Claims**



1. In a grate tumbler for the tumbler grate of a trash incineration installation or the like, having a long axis with a hollow shaft and a cylindrical carrier construction, with grate-bar carriers resting upon the carrier construction upon which grate bars are mounted, the improvement comprising:

the grate bars being mounted upon the grate-bar carriers and comprising a base rod having an outer rod surface facing a combustion chamber of the incineration facility, an inner rod surface, side surfaces, a head surface, and a foot surface;

each grate bar having a cross rod located at an end of the base rod in proximate location to the combustion chamber so that the cross-section form of the grate bar is a T-shape; and

adjacent ones of said grate bars being mounted in parallel spaced apart relation so as to define a slit between said cross rods of adjoining grate bars, the slit between adjoining grate bars being not more than substantially 2 mm wide on the combustion-chamber side.

**4,610,210**

## SEWING MACHINE

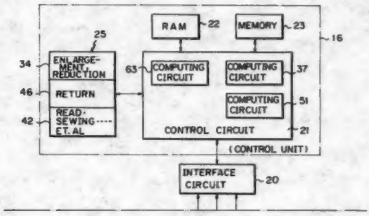
**Tomoaki Kinoshita, Kanagawa; Kunio Takano, Tokyo; Minoru Wada, Tokyo; Osamu Tachikawa, Tokyo, and Hiroshi Tokunaga, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd, Tokyo, Japan**

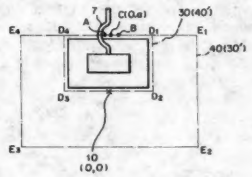
**Filed Jul. 24, 1985, Ser. No. 758,656**

**Claims priority, application Japan, Jul. 31, 1984, 59-160776**

**Int. Cl.⁴ D05B *21/00***

**U.S. Cl. 112—121.12** **11 Claims**



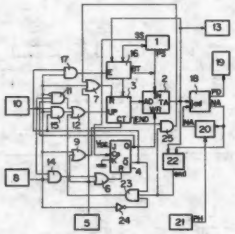

1. A sewing machine for use in sewing closed patterns of different sizes and having spaced apart pattern start and termination points, said sewing machine comprising a workholder for moving a workpiece, force transmitting means connected with said workholder for moving the workholder, said force transmitting means being movable relative to said workholder between a pattern starting position in which said force transmitting means is offset to a first side of the space between the pattern start and termination points and a pattern ending position in which said force transmitting means is offset to a second side of the space between said pattern start and termination points, data storage means for storing data representative of a closed pattern having start and termination points which are spaced apart by a distance which is less than the distance through which the force transmitting means is movable, control means for controlling operation of said sewing machine to sew a closed pattern which corresponds to the pattern represented by the stored data and encloses an area which is larger or smaller than the area enclosed by the pattern represented by the stored data while maintaining the distance between start and termination points of the sewn pattern equal to the distance between the start and termination points of the pattern represented by the stored data, means for moving said force transmitting means between the pattern starting and ending positions during the sewing of patterns which are larger and smaller than the pattern represented by the stored data, said force transmitting means being disposed in the same position relative to the start and termination points of either a large or small pattern when said force transmitting means is in the pattern starting position, said force transmitting means being disposed in the same position relative to the start and termination points of either a large or small pattern when said force transmitting means is in the pattern ending position.

4,610,211

## ELECTRONIC CONTROL SEWING MACHINE

Hachiro Makabe, Kanagawa; Haruhiko Tanaka, Tokyo, and Takeshi Kongoh, Koganei, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,723
Claims priority, application Japan, Jun. 6, 1983, 58-99309
Int. Cl.[4] D05B 3/02
U.S. Cl. 112—445 2 Claims



1. An electronic sewing machine having a first memory storing a plurality of patterns in the form of stitch control data which may be sequentially read out to control stitch forming instruments of the sewing machine to form stitch patterns on a fabric, pattern selecting means including a plurality of pattern selecting switches selectively operated to produce pattern signals representing the pattern numbers each specific to the patterns stored in the first memory, a second memory having second address means for temporarily memorizing the pattern numbers produced from the pattern selecting switches, a first switch means operated to enable the second memory to memorize a series of selected pattern numbers in a desired order, a display operated each time the second memory memorizes a pattern number to display the same in place of the precededly displayed one, an improvement comprising address pointing means responsive to each operation of said first switch means to advance the addresses of said second address means progressively from the initial to the last to thereby enable said second memory to memorize the series of selected pattern numbers in a desired order, and a second switch means operated to produce a signal to reset said address pointing means to the initial address of said second memory after the latter has memorized said series of selected pattern numbers and simultaneously to enable said first switch in each operation to cause said address pointing means to progressively advance the address of said second memory such that said display is operated to indicate said pattern numbers stored in said second memory one after another in the predetermined order.

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4,610,212

## FAST SELF RIGHTING CATAMARAN

Enrique G. Petrovich, 620 SE. 18th Ave., Pompano Beach, Fla. 33060

Filed Oct. 11, 1985, Ser. No. 786,837
Int. Cl.[4] B63H 9/04
U.S. Cl. 114—39 16 Claims

1. In a sailboat having at least two elongated pontoons, a convex deck affixed to said pontoons to support a load, a plurality of spaced cross pieces secured to said pontoons to maintain them in a fixed spatial relationship, the improvements comprising:

(a) a mast and sail universally pivotally mounted near the center of said sailboat, said mast having a downward extension beneath said sailboat upon which is affixed an underwater ballast, the magnitude of said ballast in combination with said downward extension of said mast being so related to the height of said mast plus the area of said sail that said mast and sail will pivot downwardly and outwardly and said downward extension of said mast and said ballast will pivot upwardly and outwardly as said sailboat is subjected to wind thereby minimizing any vertical lift of the pontoon on the windward side of said sailboat, wherein the forward pivoting of said mast functions to minimize downward pressure on said bow of said sailboat;

(b) said sail comprising a kite type design functioning to provide lift as well as forward thrust while underway;

(c) said downward extension of said mast cooperating with at least one parallel ballast support rod pivotably affixed to said ballast and the bottom of said sailboat functioning to hold said ballast in a position parallel to said pontoons.

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4,610,213

## PRESSURE SENSING ON RIGID SAILS

John G. Walker, Hamble, United Kingdom, assignor to Young & Thompson, Arlington, Va.

PCT No. PCT/GB83/00205, § 371 Date Apr. 6, 1984, § 102(e) Date Apr. 6, 1984, PCT Pub. No. WO84/00732, PCT Pub. Date Mar. 1, 1984
PCT Filed Aug. 18, 1983, Ser. No. 599,611
Claims priority, application United Kingdom, Aug. 18, 1982, 8223762
Int. Cl.[4] B63H 9/06; B64C 13/16
U.S. Cl. 114—102 12 Claims

1. A sailset comprising a leading rigid upright aerofoil mounted for rotation about an upright axis and a trailing rigid upright aerofoil pivotable about an upright axis to adopt positions cambered with respect to the leading element, a pressure tapping located on the centre line of the leading edge of the leading aerofoil, a pair of pressure tappings located symmetrically on opposite sides of the leading edge of the leading aerofoil and control means for rotating the sailset responsive to a difference in the difference values between the pressure sensed at the central tapping and that at each of the pair of tappings.

4,610,214

## ROTATION CONTROL SYSTEM FOR Z-TYPE PROPULSION APPARATUS

Masanori Kodera, Chigasaki; Yasuo Aizawa, Hiratsuka, and Kohji Ichijo, Tokyo, all of Japan, assignors to Niigata Engineering Co., Ltd., Japan

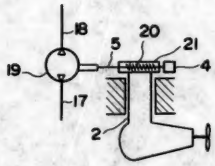
PCT No. PCT/JP84/00157, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/03870, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 30, 1984, Ser. No. 682,012

Claims priority, application Japan, Mar. 30, 1983, 58-46138[U]; Mar. 30, 1983, 58-46139[U]; May 31, 1983, 58-82605[U]; May 31, 1983, 58-82606[U]; May 31, 1983, 58-82607[U]

Int. Cl.[4] B63H *5/14*

U.S. Cl. 114—144 E 12 Claims




2. A system for controlling the rotation of a rotary housing according to claim 1, in which said steering angle detection means and said follow-up angle detection means comprise potentiometers.

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4,610,215

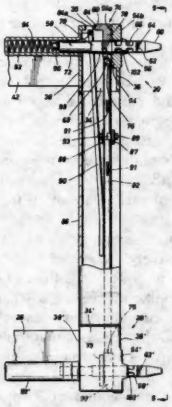
## CONSTRUCTION COMPONENTS WITH IMPROVED LOCKING SYSTEM

Alces P. Robishaw, 9333 Memorial #210, Houston, Tex. 77024, and Paul A. Robishaw, 10122 Meadow Lake La., Houston, Tex. 77042

Filed Aug. 17, 1984, Ser. No. 642,181

Int. Cl.[4] B63B *35/38*

U.S. Cl. 114—249 33 Claims



1. A construction component comprising:

a plurality of male lock assemblies arranged in pairs, the two male lock assemblies of each of said pairs being vertically spaced from each other along a lateral wall of said component, and each of said male lock assemblies comprising:

a male body fixedly mounted on said component;

a rigid pin member carried by said male body for reciprocation between an advanced position in which said pin member protrudes from said lateral wall of said construction component and a retracted position in which said pin member lies generally within the gross dimension of said construction component;

resilient biasing means cooperative between said male body and said pin member, to yieldably bias said pin member to said advanced position;

and male lock means carried on said male body and cooperative with said pin member, when said pin member is in its retracted position, to selectively prevent movement of said pin member to its advanced position;

and a plurality of female lock assemblies adapted for engagement with such male lock assemblies of a similar construction component for locking the components together, said female lock assemblies being arranged in pairs, the two female lock assemblies of each of said pairs being vertically spaced from each other along a lateral wall of said component, and each of said female lock assemblies comprising a female body including female socket means defining a female socket opening adapted for receipt of such a pin member, and female lock means movable with respect to said female socket means between a release position and a locking position for selectively locking such pin member in said female socket means.

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4,610,216

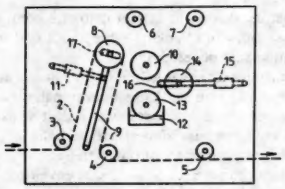
## PAPER COLORING APPARATUS

Gustav Paulsen, Roaldsoy, N-4000 Stavanger, Norway

Filed Apr. 2, 1985, Ser. No. 719,207

Int. Cl.[4] B05C *1/28*

U.S. Cl. 118—46 6 Claims



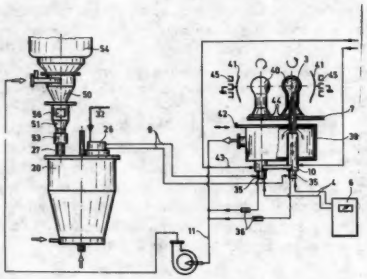

1. Paper colouring apparatus particularly for rotation printing presses for the colouring ordinarily of white paper to the desired colour before the paper web (2) is drawn into the printing press, and where the paper web (2) passes several guide rollers (3, 4, 5) plus a displaceable roller (8) which can be displaced towards and away from a colouring roller (10), in that the colouring roller (10) is supplied with dye from a dye bath (12) via a dye roller (13) which protrudes down into the dye bath (12), and a displaceable intermediate roller (14) which can be displaced towards and away from the dye roller (13) and colouring roller (10), characterized in the displaceable rollers (8, 14) being displaced with the aid of compressed air cylinders (11, 15), and by the pressure of the displaceable rollers (8, 14) against the counter-rotating rollers (10, 13) being regulated with the aid of regulation valves in the appropriate compressed air circuits, in that the displaceable roller (14) has a moveable support such that it automatically adjusts to constant alignment in both horizontal and vertical planes with uniform pressure along the entire length of the roller.

4,610,217

## APPARATUS FOR ELECTROSTATIC SPRAYING OF THE INSIDES OF LAMP ENVELOPES

András Czeiler; Miklós Kéri; Béla Balogh; Ernö Fejes; István Kállai, and Sándor Lukács, all of Budapest, Hungary, assignors to Tungsram Reszvenytarsasag, Budapest, Hungary

Continuation of Ser. No. 491,570, May 4, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,609
Claims priority, application Hungary, Sep. 22, 1982, 3035/82
Int. Cl.[4] B05B 5/02, 13/02, 13/06
U.S. Cl. 118—47 3 Claims



1. An apparatus for electrostatically coating the insides of light-transmissive lamp envelopes which comprises:

a stand;

a turntable mounted on said stand and formed with means for receiving pairs of such envelopes distributed about said turntable;

heat radiators shaped to conform to the configurations of said envelopes and flanking same about said turntable for preheating said envelopes;

a pair of nozzles disposed below said turntable and displaceable upwardly into said envelopes in pairs upon the heating thereof for spraying respective dust streams into the heated envelopes for depositing particles of the dust of said streams upon inner surfaces thereof;

grounded gas burners for heating said envelopes during said spraying and establishing an electrical circuit between the glass of the envelopes and the gas flame;

an electrostatic voltage source connected to said nozzles for negatively charging said particles of the dust so that the particles are electrostatically attracted to said envelopes due to the electric field generated between the electrostatic voltage source and the grounded gas burner;

homogenizing means connected with said nozzles for forming said streams and including a rotary chopper for breaking up dust agglomerates and dispersing said dust in a gas to form said streams;

means associated with each of said nozzles for exhausting excess dust from said envelopes;

means for transporting said dust streams connected between each of said nozzles and said homogenizing means and including a cyclone for removing large particles from said streams; and

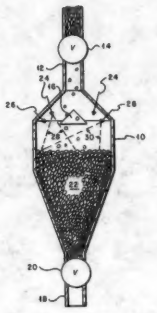
cleaning means including a blowing inlet connected between each of said cyclones and the respective nozzle for cleaning same.

4,610,218

## APPARATUS FOR INTIMATELY CONTACTING PARTICULATE SOLIDS WITH A HEAVY LIQUID

Steven W. Johnson, Plano, and Alden W. Olsen, Allen, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 21, 1985, Ser. No. 714,714
Int. Cl.[4] B05B 17/00; B05C 13/02
U.S. Cl. 118—303 8 Claims



1. An apparatus for intimately contacting particulate solids with a heavy liquid, said apparatus comprising:

(a) a contacting vessel;

(b) a particulate solids inlet means in communication with an upper end of said contacting vessel and positioned to discharge a stream of said particulate solids downwardly into said upper end of said contacting vessel;

(c) a generally conical deflector means having an outer diameter less than an inner diameter of said contacting vessel and positioned in said contacting vessel and beneath said particulate solids inlet to deflect said stream of said particulate solids outwardly over an outer diameter of said deflector means;

(d) an inlet control means operatively associated with said particulate solids inlet means to control the flow of particulate solids into said contacting vessel and prevent the discharge of gaseous materials from said contacting vessel through said particulate solids inlet means;

(e) a particulate solids outlet means in communication with the lower end of said contacting vessel and positioned to discharge a stream of particulate solids from said contacting vessel;

(f) an outlet control means comprising a loosely fitted monitoring valve operatively associated with said particulate solids outlet means to control the flow of said particulate solids from said contacting vessel so that a bed of said particulate solids is maintained in a lower portion of said contacting vessel so that gaseous materials are exhausted from said contacting vessel through said bed of said particulate solids; and,

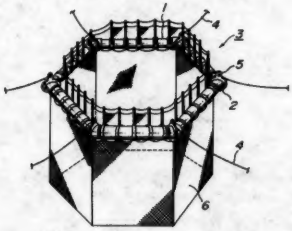
(g) spray means for the injection of a spray of dispersed heavy liquid and a carrier gas positioned in said contacting vessel to spray said dispersed heavy liquid onto said particulate solids as said particulate solids fall downwardly to the bed of said particulate solids, said spray means being positioned so that no spray is directed toward the inner walls of said contacting vessel.

**4,610,219**

## FLOATING FRAME MEMBER FOR USE IN A FISH BREEDING APPARATUS

**Shinji Morimura, Kanagawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan**

**Filed Jan. 28, 1985, Ser. No. 695,502**
**Int. Cl.[4] A01K *63/00***
**U.S. Cl. 119—3** **2 Claims**



1. A floating frame member for use in a fish breeding apparatus, which is a hollow rod-shaped elastic body constituting a main part of a gas chamber therein, said elastic body being composed of rubber or rubbery elastic material and reinforced with fiber cords to have an outer diameter of about 279.4-about 609.6 mm (11–24 inches), a thickness of about 12.7–50.8 mm ($\frac{1}{2}$–2 inches) and a product between a Young's modulus and a sectional secondary moment of 100–3,000 kg·m$^2$, and having a ratio of circumferential stress to axial stress of 1.5–2.5 when an internal pressure of 0.1–20 kg/cm$^2$ is applied to said elastic body.

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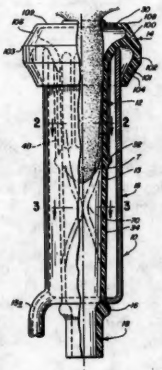
**4,610,220**

## INFLATION FOR A TEAT CUP

**Edward Goldberg, 225 Maple Hill Rd., Glencoe, Ill. 60022, and Seymour Bazell, 9235 N. Latrobe, Skokie, Ill. 60077**

**Filed May 6, 1985, Ser. No. 730,389**
**Int. Cl.[4] A01J *5/04***
**U.S. Cl. 119—14.47** **14 Claims**



1. In a unitary inflation suitable for insertion into a teat cup, to be used with a milking machine of the kind that applies pulsating pressure to a substantially airtight chamber found between the outside of the inflation and the inside of the cup, and a sub-atmospheric pressure to the interior of the inflation, the pulsating pressure varying between a higher pressure that is greater than the sub-atmospheric pressure and lower pressure, the improvement comprising:

an elongated resilient tube having an upstream retaining skirt for stretch fitting over an upstream end of the teat cup, and an external annular rib for tensioning against the lower end of the teat cup to provide a chamber between said tube and the teat cup interior for receiving application of the pulsating pressure,

said tube having annular flange means extending inwardly, at the upstream end of said tube, from said retaining skirt, said flange means being adapted to receive and hold a teat, and

said tube having an annular bead axially spaced by approximately a teat length downstream from said flange means, said annular bead being adapted to inhibit collapse when said chamber is at the higher pressure and the interior of said tube is at the sub-atmospheric pressure; and connection means at the downstream end of said tube for communicating the sub-atmospheric pressure to the interior of said tube.

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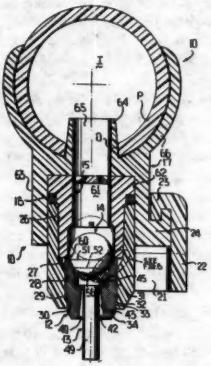
**4,610,221**

## NIPPLE FOR FEEDING LIQUIDS TO FOWL AND/OR SMALL ANIMALS

**Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.**

**Continuation of Ser. No. 595,577, Apr. 2, 1984, Pat. No. 4,524,724. This application Jun. 24, 1985, Ser. No. 747,574**
**Int. Cl.[4] A01K *7/06*; F16K *1/44***
**U.S. Cl. 119—72.5** **1 Claim**



1. A nipple particularly adapted for feeding liquid to fowl and/or small animals comprising a housing, a rigid metallic insert in said housing, means for defining a passage through said metallic insert through which liquid is adapted to pass from an upstream passage portion to a downstream passage portion, valve means in said passage for controlling the flow of liquid therethrough, said valve means including a metallic spherical ball of a predetermined diameter and first and second peripheral valve seats within said upstream passage portion, said first peripheral valve seat being upstream from said second peripheral valve seat, said first peripheral valve seat having a diameter less than said ball predetermined diameter but greater than the diameter of said second peripheral valve seat, said metallic ball being seated under the influence of gravity/liquid pressure upon each of said first and second peripheral valve seats in a closed position of said valve means and defining therewith respective first and second liquid seals, a stem disposed in part within said passage, said stem having an interior end portion adjacent said metallic ball and an exterior end portion projecting outwardly of said downstream passage portion whereby fowl and/or small animals can manipulate

said stem to move said metallic ball and unseat the same from said first and second peripheral valve seats breaking said respective first and second liquid seals and effecting liquid flow through said passage means, said metallic insert includes an exterior surface in press-fit relationship to an interior surface of said housing, said metallic insert has a relatively thick cross-section, said housing interior surface being defined by first and second cylindrical surfaces and an annular surface therebetween, said first cylindrical surface being upstream from and of a greater diameter than said second cylindrical surface whereby said annular surface defines a shoulder, said metallic insert includes corresponding first and second exterior surfaces and an exterior annular surface in intimate engagement with said housing first and second cylindrical surfaces and said housing annular surface respectively, said metallic insert has a downstream end projecting beyond a downstream portion of said housing and said shoulder, an upstream portion of said housing being removably connected to said downstream housing portion, and said upstream housing portion having a downstream edge axially opposing said housing shoulder whereby a major portion of the length of said metallic insert is confined between said shoulder and downstream edge.

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**4,610,222**

## COOLING SYSTEM USING AN OIL-IN-ALCOHOL CONTAINING CONSOLUTE ANTIFREEZE COMPOSITION

**Errol D. Goddard, Haworth, N.J.; Pak S. Leung, Highland Mills, and Paul H. Mohr, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.**

**Filed Jul. 23, 1984, Ser. No. 633,445**
**Int. Cl.[4] F01P *3/00*; C09K *5/00***
**U.S. Cl. 123—41.42** **26 Claims**

7. A method of cooling an internal combustion engine which comprises contacting hot metal portions of an operating internal combustion engine coolant system with an oil-in-alcohol containing consolute and antifreeze composition thereby raising the temperature of said antifreeze to at least a cloud point of about 40° C., thereby causing the oil in said consolute antifreeze composition to become insoluble therein and to separate therefrom and coat metal surfaces of the coolant system with an oil film, thereby imparting a corrosion inhibition property to said antifreeze composition with respect to said metal surfaces, wherein said antifreeze composition is a microemulsion and additionally contains an emulsifier providing a cloud point between 40° C. and 125° C. for the antifreeze composition, and wherein said emulsifier consists of a mixture of at least one non-ionic surfactant together with at least one anionic or cationic surfactant.

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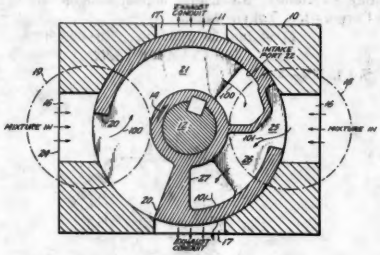
**4,610,223**

## CAM ENGINE

**Paul Karlan, 511 Center Ave., Mamaroneck, N.Y. 10543**

**Continuation-in-part of Ser. No. 646,857, Sep. 4, 1984. This application Apr. 12, 1985, Ser. No. 722,515**
**Int. Cl.[4] F02B *75/26***
**U.S. Cl. 123—58 AM** **2 Claims**

1. In a disk valve structure in an internal combustion cam engine, said valve having an axis of rotation and disposed within a housing for feeding and exhausting fuel mixtures, said housing having on each side thereof a pair of cylinder blocks with each block having a pair of cylinders disposed on opposite sides of said axis of rotation, the improvement comprising: each of said cylinder blocks having at least one carbureting source adjacent each cylinder thereof, said disk valve being configured to conduct fuel mixture to each cylinder of each pair of blocks from said carbureting source disposed on the opposite cylinder of said respective block, whereby fuel mixture may absorb heat from said disk valve during an intake stroke of each individual cylinder.

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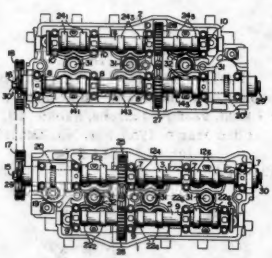
**4,610,224**

## CONFIGURATION FOR V TYPE DOUBLE OVERHEAD CAM SHAFT ENGINE UTILIZING INTERCHANGABLE INTAKE CAM SHAFTS AND INTERCHANGABLE EXHAUST CAM SHAFTS

**Hiroya Fujita, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Filed Sep. 26, 1985, Ser. No. 780,609**
**Claims priority, application Japan, Dec. 20, 1984, 59-269177**
**Int. Cl.[4] F01L *1/02***
**U.S. Cl. 123—90.31** **2 Claims**



1. A configuration for a V type double overhead cam shaft engine comprising a crank shaft, a left cylinder bank with a left bank cylinder head, and a right cylinder bank with a right bank cylinder head, wherein:

(a) a left bank intake cam shaft is fitted to said left bank cylinder head and a right bank intake cam shaft is fitted to said right bank cylinder head, said left bank intake cam shaft being substantially identically formed to said right bank intake cam shaft and being fitted in reversed alignment thereto;

(b) a left bank exhaust cam shaft is fitted to said left bank cylinder head and a right bank exhaust cam shaft is fitted to said right bank cylinder head, said left bank exhaust cam shaft being substantially identically formed to said right bank exhaust cam shaft and being fitted in reversed alignment thereto;

(c) a pair of the same type of said cam shafts are driven in a determinate phase relationship with said engine crank shaft;

(d) a pair of left bank gears, with the same number of teeth, are provided one on said left bank intake cam shaft and one on said left bank exhaust cam shaft, and mesh together so as to rotationally couple together said left bank intake

cam shaft and said left bank exhaust cam shaft in a determinate phase relationship;

(e) a pair of right bank gears, with the same number of teeth, are provided one on said right bank intake cam shaft and one on said right bank exhaust cam shaft, and mesh together so as to rotationally couple together said right bank intake cam shaft and said right bank exhaust cam shaft in a determinate phase relationship; and

(f) at said left cylinder bank and at said right cylinder bank, the number n of teeth of the phase difference of said pairs of gears is determined by the equation:

$$n=(\text{gamma}/180°)N$$

where gamma is the phase difference angle of the intake cam shaft and the exhaust cam shaft, and N is the number of teeth on the gears.

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**4,610,225**

## HYDRAULIC TAPPET FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE VALVE

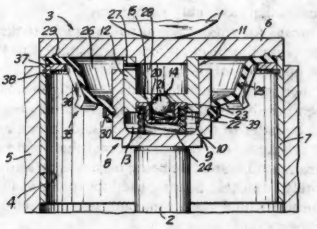
**Domenico Camosso, Turin; Silvio Ragazzoni, Pino Torinese, and Franco Colanzi, Turin, all of Italy, assignors to RIV-SKF Officine di Villar Perosa, SpA, Turin, Italy**

**Filed Mar. 26, 1985, Ser. No. 716,246**

**Claims priority, application Italy, Mar. 27, 1984, 67294 A/84**

**Int. Cl.[4] F01L** *1/24*

**U.S. Cl. 123—90.55** **10 Claims**



**1.** A hydraulic tapped designed for assembly on a drive and for controlling a valve on an internal combustion engine having a crankcase, said tappet comprising a first element moving in relation to said crankcase and a second element moving axially in relation to said first element; a first variable-volume chamber having an inlet duct for passage of drive fluid being formed between said first and said second elements, said inlet duct being controlled by an on-off member in such a manner that the fluid flowing into the chamber causes one of said elements to move axially in relation to the remaining element and to vary the volume of said chamber, said second element comprising a bucket element connected by means of a sliding connection to a sliding annular member integral with said first element and to form said first chamber betweem said bucket element and said sliding annular member, an annular element made of deformable material arranged around said bucket element and said sliding annular member forming a second annular chamber for said drive fluid connected hydraulically to said first chamber, said annular element of deformable material having first and second annular edges fixedly sealed to said first and second moving elements, respectively, and said sliding connection communicating hydraulically with said second chamber.

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**4,610,226**

## COMBUSTION DEVICE OF AN INTERNAL COMBUSTION ENGINE

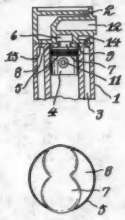
**Takeshi Okuma, No. 2962-23, Zindaiji, Chofushi, Tokyo, Japan**

**Filed May 18, 1984, Ser. No. 612,018**

**Claims priority, application Japan, May 18, 1983, 58-87100**

**Int. Cl.[4] F02P** *23/00;* **F02B** *19/08, 23/04*

**U.S. Cl. 123—143 A** **1 Claim**



**1.** A combustion device of an internal combustion engine including

a cylinder;

a cylinder head closing one end of said cylinder; and

a piston reciprocable in said cylinder;

said head and piston having stepped portions adapted to interfit as said piston approaches said head so as to define a compression chamber, and a combustion chamber of greater volume than that of said compression chamber, for receiving a fuel charge, and a restricted passage from said compression chamber to said combustion chamber;

said stepped portions comprising means for compressing and combusting a portion of the charge compressed in said compression chamber, as said piston approaches dead center, so as to spread combustion gases and flame through said restricted passage so as to immediately thereafter cause swirling of, and ignition of the portion of the charge in, the gases in said combustion chamber;

said head having a cylindrical wall having a central axis, defining therein said combustion chamber, said piston having a forward end having a cross section perpendicular said axis generally in the shape of a figure **8**, having first and second circular portions meeting at a center portion, said restricted passage being defined between said center portion and said cylindrical wall.

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**4,610,227**

## AUTOMATIC DECOMPRESSION SYSTEM FOR STARTING ENGINE

**Keiichi Nakano; Tatsutoshi Umeda, and Yoshio Tani, all of Osaka, Japan, assignors to Kubota Limited, Osaka, Japan**

**Filed Jan. 16, 1985, Ser. No. 691,764**

**Claims priority, application Japan, Jan. 20, 1984, 59-7098**[U]; Apr. 20, 1984, 59-59214[U]

**Int. Cl.[4] F01L** *13/08*

**U.S. Cl. 123—182** **4 Claims**

**1.** An automatic decompression system for starting an engine comprising:

a cam shaft;

a crank shaft;

a crank case in which said cam shaft and said crank shaft are disposed;

a flange disposed around said cam shaft;

a cam formed around said cam shaft, apart from and facing a first side of said flange;

a cam gear fitted on said cam shaft so as to contact said flange at a second side opposite said first side;

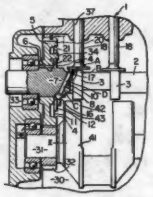
a guide hole expending transversely through said cam shaft between said cam and said flange;

a decompression pin provided to pass reciprocably through said guide hole;

a fly weight pivotally mounted on a first side of said cam gear facing said cam, said fly weight having an output part for receiving a first end of said decompression pin and a biasing spring means for biasing said decompression pin; and

a tappet disposed at a second end of said decompression pin opposite said first end of said decompression pin;

wherein said fly weight is positioned between an inner periphery of a rim of said cam gear and an outer periphery of said flange, outward movement of said fly weight being



limited by said inner periphery, and inward movement of said fly weight being limited by said outer periphery of said flange;

whereby said decompression pin is initially biased upwardly, contacting said tappet, and upon starting of the engine, said cam shaft has a turning speed sufficient to produce a centrifugal force in said fly weight greater than said biasing force, so as to move said fly weight outwardly against said biasing force of said biasing spring means until said fly weight is received by said inner periphery of said rim of said cam gear.

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**4,610,228**

## CRANKCASE ASSEMBLY FOR AN ENGINE OF A PORTABLE TOOL

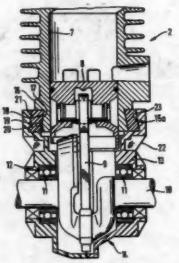
**Reinhold Fink, Fellbach, and Michael Leuchte, Stuttgart, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany**

**Filed Aug. 2, 1985, Ser. No. 762,108**

**Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430645**

**Int. Cl.[4] F02F *7/00***

**U.S. Cl. 123—195 R** **15 Claims**



1. A crankcase assembly for an engine of a portable tool such as a chain saw or the like, the engine including a cylinder, a piston arranged for movement in the cylinder, a crankshaft and a connecting rod interconnecting the piston and the crankshaft, the crankcase assembly comprising:

a plastic crankcase for enclosing the crankshaft;

bearing means for rotatably journalling said crankshaft in said crankcase; and,

fastening means for fastening said crankcase to said cylinder, said fastening means including an annular insulating member interposed between said crankcase and said cylinder.

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**4,610,229**

## CRANKSHAFT ASSEMBLY FOR AN ENGINE OF A PORTABLE TOOL

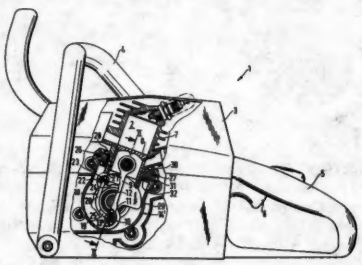
**Michael Wissmann, Markgröningen; Hans Nickel, Cottenweiler; Reinhold Fink, Fellbach, and Michael Leuchte, Stuttgart, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany**

**Filed Aug. 2, 1985, Ser. No. 762,103**

**Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430644**

**Int. Cl.[4] F02F *7/00***

**U.S. Cl. 123—195 R** **16 Claims**



1. A crankshaft assembly for an engine of a portable tool such as a chain saw or the like, the engine including a cylinder, a piston arranged for movement in the cylinder, a crankshaft and a connecting rod interconnecting the piston and the crankshaft, the crankshaft assembly comprising:

bearing means for rotatably journalling said crankshaft and for receiving the reaction forces transmitted to the latter during operation of the engine;

bearing shell means for holding said bearing means therein, said bearing shell means being rigidly connected directly to said cylinder to thereby take up said forces; and,

a plastic crankcase enclosing said crankshaft and said bearing means, said crankcase being mounted on said cylinder separately from said bearing shell means so as to prevent transmitting said forces from said bearing shell means to said plastic crankcase.

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**4,610,230**

## THROTTLE CONTROL APPARATUS

**Hiroshi Saito, Tokyo; Hideaki Nebu; Tsuneaki Sakamoto, both of Shiki, and Tomoyasu Tanino, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 14, 1985, Ser. No. 745,013**

**Claims priority, application Japan, Jun. 15, 1984, 59-123394**

**Int. Cl.[4] F02D *11/02***

**U.S. Cl. 123—360** **5 Claims**

1. A throttle control apparatus for an internal combustion engine for a powered vehicle having in the internal combustion engine an induction system including a throttle valve therein, comprising

manually operated first throttle valve actuating means rotatable in either direction about an axis fixed with respect to the vehicle body;

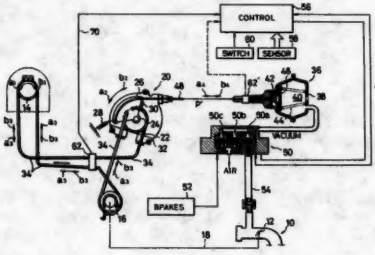
first linkage means for providing driving connection selectively in one of two opposite directions from said first throttle valve actuating means to said throttle valve;

a control circuit for producing a control signal when actuated;

drive means responsive to said control signal for producing a driving force in one direction;

second throttle valve actuating means for providing driving connection from said drive means to said throttle valve;

second linkage means for transmitting said driving force to said second throttle valve actuating means, one of said first and second linkage means being operative to produce a mechanical stress therein with said first throttle valve




actuating means manually operated to provide driving connection to said throttle valve in one of said opposite directions through said first linkage means; and

switch means including a movable member movable in response to said mechanical stress for producing a signal effective to disable said control signal from said control circuit.

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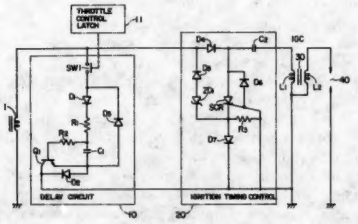
**4,610,231**

## START SAFETY APPARATUS FOR INTERNAL COMBUSTION ENGINE

**Hiroshi Nakata, Yokohama, and Houkichi Souma, Hino, both of Japan, assignors to Oppama Kogyo Kabushiki Kaisha, Yokosuka, Japan**

**Filed Nov. 15, 1984, Ser. No. 671,887**
**Claims priority, application Japan, Sep. 5, 1984, 59-133994[U]**
**Int. Cl.⁴ F02P *5/02***
**U.S. Cl. 123—424** **1 Claim**




1. A start safety apparatus of an engine adapted for a multi-purpose power tool comprising:

an engine;

an exciter coil generating alternate electromotive force in synchronism with rotation of said engine;

an ignition coil having primary and secondary windings;

a spark plug connected to the secondary winding of said ignition coil;

a capacitor connected to the primary winding of said ignition coil, said capacitor being charged with a positive half-cycle of said electromotive force;

ignition timing control means for controlling discharge of said capacitor;

a throttle control latch for setting a throttle valve of the engine in a predetermined throttle angle;

a tool driven by said engine; and

a centrifugal clutch transferring engine power to said tool when an engine speed exceeds a clutch-in speed,

wherein said ingition timing control means includes a semiconductor switching device controlled by a trigger voltage, said switching device being conductive by said trigger voltage during a period of a negative half-cycle of said electromotive force when the negative voltage of said negative half-cycle of the electromotive force reaches to a predetermined level, and at the same time the charged voltage of said capacitor is discharged through said conductive switching device, said ignition timing control means includes ignition timing retard means for retarding ignition timing from a regular ignition timing to reducing the engine speed lower than said clutch-in speed in response to activation of said throttle control latch when the engine is started in such a manner that said exciter coil is shunted in a predetermined period during the negative half-cycle of said electromotive force thereby to reduce the trigger voltage lower than a level as said switching device is conductive so as to retard the spark timing by said predetermined period.

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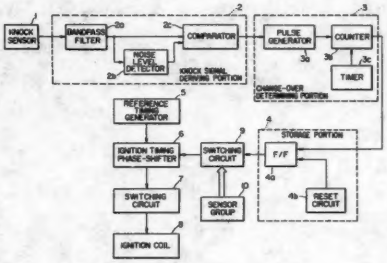
**4,610,232**

## IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

**Toshio Iwata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 3, 1984, Ser. No. 657,245**
**Claims priority, application Japan, Oct. 4, 1983, 58-188096**
**Int. Cl.⁴ F02P *5/04***
**U.S. Cl. 123—425** **7 Claims**




1. An ignition timing control apparatus for an internal combustion engine comprising:

vibration acceleration sensing means for sensing knock signals of said engine;

means responsive to the output of said sensing means for deriving said knock signals including a bandpass filter connected to said sensing means to pass therethrough only a frequency component inherent in the knocks, a noise level detector for converting the output of said bandpass filter into a DC voltage with a predetermined amplification, said DC voltage being higher than the noise component while lower than the knock component of the filtered output, and a comparator for comparing the outputs of said filter and said noise level detector to derive said knock signals;

means responsive to the output of said knock signal deriving means for determining whether the current ignition timing characteristic is required to be changed over including a pulse generator connected to said comparator to generate one pulse per the occurrence of knock during one ignition and a counter connected to said pulse generator to count the output pulses of said pulse generator and to provide a logic signal indicating the presence of a predetermined knock occurrence rate per a predetermined time interval defined by a timer;

means responsive to the output of said determining means

for setting a reference ignition timing characteristic including a flip-flop set by said logic signal from said counter, a reference ignition timing signal generator, the ignition timing characteristic of which is set for a high-octane rating fuel, an ignition timing phase-shifter for shifting the timing of said reference ignition timing signal of said generator by a preset fixed value dependent upon the output of said flip-flop to control the ignition timing of an ignition coil; and

means for overriding the output of said determining means when said engine lies in predetermined operating regions to fix the ignition timing corresponding to said predetermined operating regions including operating region sensing means for said engine comprising an engine speed sensor, an intake air pressure sensor and an overriding circuit responsive to said operating region sensing means connected between said flip-flop and said ignition timing phase-shifter, said overriding circuit comprising and AND gate, one input of which is connected to said flip-flop, a first OR gate, one input of which is connected to said engine speed sensor and the other input of which is connected to said pressure sensor, and a second OR gate, one input of which is connected to the output of said AND gate and the other of which is connected to said pressure sensor, the output of said first OR gate being connected to the other input of said AND gate, and the output of said second OR gate being connected to said phase-shifter.

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**4,610,233**

## FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

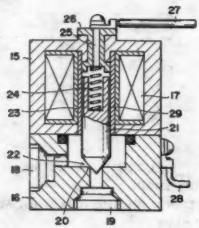
**Takeo Kushida; Tsuneyuki Chiyoda, and Keiichi Yamada, all of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Mar. 25, 1985, Ser. No. 716,129**

**Claims priority, application Japan, Apr. 5, 1984, 59-49872[U]**

**Int. Cl.[4] F02M *39/00***

**U.S. Cl. 123—458** **3 Claims**




1. A fuel injection system for an internal combustion engine, comprising:

(a) a fuel injection pump operative in inject fuel into the internal combustion engine and having a fuel passage defined therein;

(b) a solenoid valve disposed across said fuel passage to perform a periodic valve opening and closing action for controlling the flow of fuel passing thereacross;

(c) first means disposed in said solenoid valve for electrically detecting said valve opening and closing operation;

(d) second means for electrically detecting an engine operating condition of the internal combustion engine; and

(e) a control circuit connected with said first and second detecting means and said solenoid valve for controlling said valve opening and closing operation of said solenoid valve on the basis of said engine operating condition detected and said valve opening and closing action detected;

said first detecting means comprising an electric on-off switch adapted to be opened and closed in synchronism with said valve opening and closing action of said solenoid valve;

said solenoid valve including a valve chamber held in fluid communication with said fuel passage, a valve seat of conductive material facing said valve chamber, and a valve element of conductive material reciprocably movable toward and away from said valve seat to keep said valve chamber in and out of fluid communication with said fuel passage, said electric switch being jointly defined by said valve seat and said valve element.

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**4,610,234**

## INJECTION TIMING CONTROL DEVICE FOR DISTRIBUTOR-TYPE FUEL INJECTION PUMPS

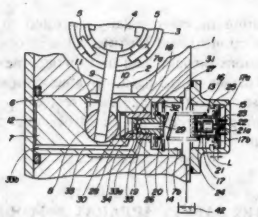
**Toru Sakuranaka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Jun. 7, 1985, Ser. No. 742,614**

**Claims priority, application Japan, Jun. 12, 1984, 59-86870[U]**

**Int. Cl.[4] F02M *39/00***

**U.S. Cl. 123—502** **2 Claims**



1. An injection timing control device for combination with a fuel injection pump for an internal combustion engine, said pump being of the type having a suction space filled with fuel under pressure variable as a function of the rotational speed of said engine, a pumping and distributing plunger, and a roller holder carrying a plurality of rollers circumferentially arranged and disposed in camming engagement with said plunger, said injection timing control device comprising: a cylinder; a timer piston slidably received within said cylinder, said timer piston being coupled to said roller holder such that displacement thereof causes a corresponding chnage in the circumferential position of said roller holder; a first chamber defined at one end of said timer piston; a second chamber defined at an opposite end of said timer piston, said second chamber communicating with a zone under lower pressure; a timer spring accommodated within said second chamber; a communication passageway extending between said suction space of said pump and said first chamber and being located at least in part within said timer piston; servo valve means arranged across said communication passageway at a location within said timer piston, said servo valve means having a valve body displaceable relative to said timer piston against the force of said timer spring in response to a change in fuel pressure within said suction space, to selectively assume a first position where it disconnects said first chamber with respect to said valve body from said suction space and simultaneously communicates same with said second chamber, a second position where it communicates said first chamber with said suction space and simultaneously disconnects same from said second chamber, and a third position where it disconnects said first chamber from both of said suction space and said second chamber, said timer spring exerting an urging force upon said valve body; said timer spring having an initial length to apply an initial setting load to said valve body of said servo valve when said timer piston and said valve body of said servo valve means both assume initial positions just before the start of said engine; and spring force control means responsive to a temperature of said engine for changing the initial setting load of said timer

spring, said spring force control means including a thermo-sensitive wax pellet element arranged in said second chamber and which is variable in volume in response to a change in the temperature of fuel within said second chamber, a spring seat member having one surface disposed in urging contact with said opposite end of said timer spring and an opposite surface urged by said thermo-sensitive wax pellet element against the urging force of said timer spring and displaceable in response to a change in the volume of said thermo-sensitive wax pellel element for changing the initial length of said timer spring, stopper means for holding the initial length of said timer spring at a value corresponding to a predetermined value of said initial setting load of said timer spring irrespective of change of the volume of said thermo-sensitive wax pellet element when the temperature of said engine is higher than a predetermined value, said stopper means being disposed to engage said spring seat member at a predetermined location for prohibiting displacement of said spring seat member toward said timer piston beyond said predetermined location, and a buffer spring urging said thermo-sensitive wax pellet element against the force of said timer spring, said buffer spring being disposed to be contracted by an increase in the volume of said thermo-sensitive wax pellet element when said spring seat member engages said stopper means, whereby when the temperature of said engine is higher than said predetermined value, the initial setting load of said timer spring is held at said predetermined value, while when the temperature of said engine is lower than said predetermined value, the initial setting load of said timer spring is reduced below said predetermined value.

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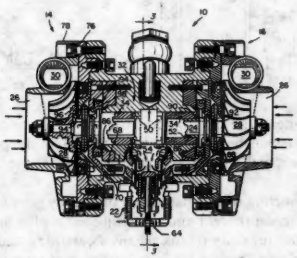
**4,610,235**

## HYDRAULIC DRIVE SUPERCHARGER FOR INTERNAL COMBUSTION ENGINES

**R. Carricarte Grunig, Calz. I, Aragoza 126, Col. Moctezuma, 15500 - Mexico City, Mexico**

**Filed Aug. 8, 1983, Ser. No. 521,403**
**Claims priority, application Mexico, Aug. 9, 1982, 194310**
**Int. Cl.[4] F02B *33/40***
**U.S. Cl. 123—565** **5 Claims**



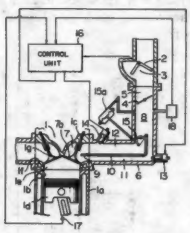
1. A supercharger for an internal combustion engine comprising a housing, a shaft journaled in said housing and supporting on either end an air compressor; a turbine wheel centrally journaled to said shaft and means for directing pressure oil to the turbine wheel and thence from the housing; wherein the compressors comprise vaned compressors with the curvature of the vanes being in opposite directions at opposite ends of the shaft; wherein the supercharger is combined with an internal combustion engine having an inlet header and an exhaust system wherein one of the compressors is connected by a conduit to the internal combustion engine inlet header and the other of the compressors is connected by a conduit to the exhaust system of the internal combustion engine.

**4,610,236**

## FUEL SUPPLY CONTROL FOR A DUAL INDUCTION TYPE ENGINE INTAKE SYSTEM

**Yoshinori Okino, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan**

**Filed May 22, 1984, Ser. No. 612,858**
**Claims priority, application Japan, May 24, 1983, 58-91924**
**Int. Cl.[4] F02M *51/00***
**U.S. Cl. 123—585** **17 Claims**




1. An intake system for an internal combustion engine which comprises primary intake passage means and secondary intake passage means both leading to combustion chamber means, control valve means for closing the secondary intake passage means under light load engine operation and for opening the secondary intake passage means under heavy load engine operation so that intake gas is introduced into the combustion chamber means only through the primary intake passage means under light load engine operation but through both the primary and secondary intake passage means under heavy load operation, fuel supply means for supplying a metered quantity of fuel that is required for an actual engine operating condition to said primary intake passage means when the secondary intake passage means is closed by the control valve means and to each of said primary and secondary intake passage means when the secondary intake passage means is opened by the control valve means, fuel supply compensating means for decreasing the metered quantity of fuel supply to the primary intake passage means by a predetermined amount to provide a quantity of fuel that is less than the quantity required for said actual engine operating condition and for a predetermined time when it is detected that the engine operating condition is changed from a heavy load operation condition wherein the fuel is supplied to both the primary and secondary intake passage means to a light load operation condition wherein the fuel is supplied only to the primary intake passage means and the fuel supply to the secondary intake passage means is terminated.

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**4,610,237**

## IGNITION CIRCUIT, ESPECIALLY FOR MAGNETO-TRIGGERED INTERNAL COMBUSTION ENGINES

**Dragos Ionescu, New York, and Mihai Soiman, Woodside, both of N.Y., assignors to Wedtech Corp., Bronx, N.Y.**

**Filed Feb. 21, 1985, Ser. No. 704,011**
**Int. Cl.[4] F02P *3/08***
**U.S. Cl. 123—600** **8 Claims**

1. An electronic ignition system for an internal combustion engine having at least one spark plug and a magneto having at least one magneto coil with a single low-voltage winding in said coil, said system comprising:

a charging circuit connected to said winding and providing a rectified output;

a discharge condenser continuously connected to said charging circuit and adapted to be charged by said output;

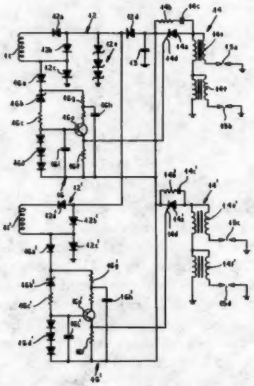
a triggering circuit including:

an electronic switch having a control electrode, and

a high voltage transformer connectable by said switch, when said switch is triggered to said condenser,

said spark plug being connected to said transformer for firing when said switch is triggered by said control electrode; and

a nonlinear network connected to said winding and logarithmically responsive to a signal generated therein for triggering said control electrode to effect a discharge of said condenser through said transformer to fire said spark plug whereby a firing point is automatically advanced and retarded depending upon the logarithmic response of said nonlinear network, said nonlinear network consisting essentially of:



a blocking diode connected to said winding at one side of said blocking diode,

a transistor having a base connected to another side of said blocking diode and two principle electrodes,

a series network of a Zener diode and a resistor interposed between said other side of said blocking diode and said base, and across said base and one of said principal electrodes of said transistor, and

means including a load resistor in series with the other of said principal electrodes for directly tapping a signal across said resistor and applying it directly to said control electrode for triggering of said switch.

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**4,610,238**

## HEADER ASSEMBLY FOR DEEP FAT FRYING COOKING SYSTEM

**George J. Veth, Fairfield, Conn., assignor to Food Automation-Service Techniques, Inc., Stratford, Conn.**

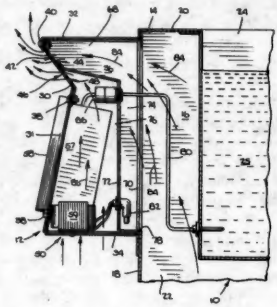
**Filed Apr. 25, 1985, Ser. No. 727,399**
**Int. Cl.[4] A21B *1/00***
**U.S. Cl. 126—21 R** **9 Claims**

1. A combination of an assembly with a cooking device having a hollow housing with at least one chamber therein and with an opening in said chamber, comprising:

a casing defining an enclosure having an opening on one side thereof and further defining first, second and third vent means therein, said first and second vent means being spaced vertically from each other;

shield means mounted within said enclosure of said casing and separating said enclosure into first and second passageways, said first vent means and said opening of said casing being in communication with said first passageway; said second and third vent means being in communication with said second passageway thereof; and

a cooking control system so mounted on said casing as to be accessible from outside said casing and extending into said second passageway whereby air within said chamber and heated by said cooking device can flow by means of convection air flow through said chamber and casing openings, said first passageway and said first vent means



thereby drawing air through said second and third vent means and said second passageway past said cooking control system to cool the same.

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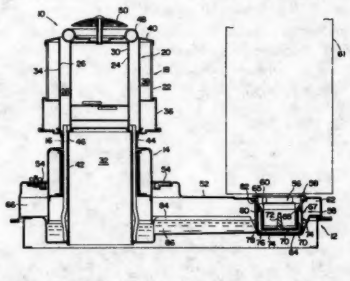
**4,610,239**

## CARTRIDGE-TYPE OIL TANK CONSTRUCTION

**Kazuharu Nakamura, Nagoya; Yutaka Nakanishi, Kounan, and Yoshiaki Hisada, Nagoya, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan**

**Filed Jan. 23, 1985, Ser. No. 693,924**
**Claims priority, application Japan, Jan. 24, 1984, 59-8569[U]**
**Int. Cl.[4] F24C *5/04***
**U.S. Cl. 126—96** **16 Claims**



1. A cartridge-type oil tank construction comprising:

an oil tank means having an opening formed at the portion of the upper wall thereof in the vicinity of one side end thereof;

a tank supporting means having an oil supply port formed at a side portion thereof and including means for invertedly supporting on said oil tank means a cartridge tank having a valved cap so that oil is fed from said cartridge tank through a valve of said cap and said oil supply port of said tank supporting means to said oil tank means,

means for detachably mounting said tank supporting means through said opening with respect to said oil tank means; and,

positioning means for positioning said oil supply port of said tank supporting means so that it faces the other side end of said oil tank means opposite to said one side end thereof when said tank supporting means is mounted through said opening with respect to said oil tank means;

said oil tank means further including a chamber provided at the outside of said tank supporting means for receiving a volume of oil sufficient to allow an oil level in said oil tank means obtained when said oil tank construction falls down

in the direction of said one side end of said oil tank means to be substantially lower than said oil supply port of said tank supporting means.

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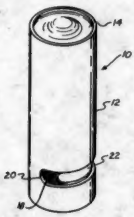
**4,610,240**
**SOLAR LIGHTER**
**John D. Burch, 3516 Dublin Rd., Charlotte, N.C. 28208**
**Filed Mar. 18, 1985, Ser. No. 713,128**
**Int. Cl.[4] F24J *2/08***
**U.S. Cl. 126—440** **12 Claims**




1. A solar furnace comprising a hollow tube having a light concentrating lens at one end thereof to focus light at the other end of said tube, a wooden base connected to said tube at the end of said tube remote from said lens, said base being removably attached to said tube, and having a plurality of vertical holes therethrough, each of a different diameter, the focal point of said lens being within one of said holes, the center of each hole being equidistant from the center of the base, whereby rearrangement of the base will bring the lens focal point within the desired diameter hole, said lens being adapted to concentrate rays of sunlight within the space defined by the edges of such hole, whereby a tobacco product or fishing line can be inserted therein and ignited by concentration of the sun's rays thereon.

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**4,610,241**
**ATHEROSCLEROSIS TREATMENT METHOD**
**Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60077**
**Filed Jul. 3, 1984, Ser. No. 627,423**
**Int. Cl.[4] A61B *17/52***
**U.S. Cl. 128—1.3** **16 Claims**

1. A process for the use of any ferromagnetic, paramagnetic, or diamagnetic particles, electric or magnetic dipoles already in an atherosclerotic lesion by the application of external electromagnetic energy capable of generating heat to alter the biophysical and/or structural properties intracellularly and extracellularly of said atherosclerotic lesions to induce the resolution of said lesion comprising:

subjecting a host having an atherosclerotic lesion to an alternating electromagnetic field to inductively heat and alter the biophysical and/or structural properties of said particles, electric or magnetic dipoles already in said atherosclerotic lesions, and thereby alter the atherosclerotic lesions,

continuing the inductive heating of said particles, electric or magnetic dipoles already in said atherosclerotic lesions to resolve said atherosclerotic lesions.

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**4,610,242**
**ENDOSCOPE INSERTION CANNULA ASSEMBLY**
**John A. Santangelo, East Freetown, and Michael DiGiantommaso, Brockton, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.**
**Filed Apr. 18, 1984, Ser. No. 601,456**
**Int. Cl.[4] A61B *1/06***
**U.S. Cl. 128—4** **5 Claims**

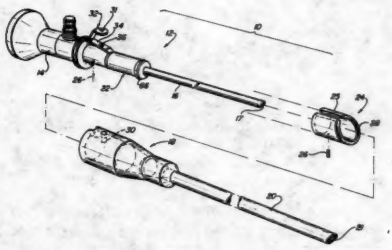
1. An assembly for permitting an endoscope instrument element to be inserted through a cannula element into the body in known orientation and for locking said cannula element and said endoscope element in that known orientation during use comprising:

means cooperatively associated with said endoscope instrument element and with said cannula element for directing the rotational orientation and controlling the axial position of one element with respect to the other, said cooperative means including:

a protrusion from one of said cooperating elements:

a guide surface on said other element for operatively engaging said protrusion to direct the rotational orientation of said protrusion as said endoscope instrument element is inserted into said cannula element regardless of the initial relative rotational orientation therebetween;

said guide surface disposed at an angle to the axis of said other element and including a slot for receiving said protrusion;



spring biased locking means for restraining the protrusion in a desired axial position, said locking means including a cam surface which moves against said protrusion as said endoscope element is inserted into said cannula element, said cam surface adapted to move out of the way as said endoscope element moves into said cannula element and then to return toward its original position as said protrusion reaches its desired axial position; and

wherein said endoscope element includes an adapter having exterior dimensions fitting said cannula element and capable of having different interior dimensions for adapting different endoscope instruments for use in the same cannula element;

whereby said instrument element is positioned in its desired rotational orientation and axial position during use.

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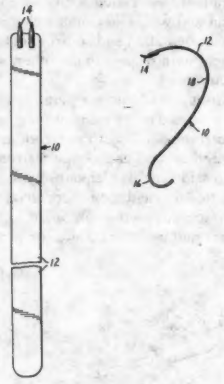
**4,610,243**
**MALLEABLE FORCE-FULCRUM RETRACTOR**
**Charles D. Ray, Deephaven, Minn., assignor to Charles D. Ray, Ltd., Wayzata, Minn.**
**Filed May 6, 1985, Ser. No. 731,025**
**Int. Cl.[4] A61B *1/00***
**U.S. Cl. 128—20** **20 Claims**

1. Force-fulcrum retractor comprising a broad band having at one end at least one point to establish a fulcrum within a surgical incision, wherein the improvement comprises:

the material of the band is sufficiently malleable so that the

band can readily be bent by hand to a desired shape while being sufficiently stiff to hold that shape against a retractile force applied to the other end of the band to pull the muscles away from the center of the incision.



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**4,610,244**
**BRACE FOR RESTRAINING SHOULDER**
**Stella J. Hammond, 1408 W. Cross St., Ypsilanti, Mich. 48197**
**Filed Oct. 11, 1985, Ser. No. 786,692**
**Int. Cl.[4] A61F *5/00***
**U.S. Cl. 128—77** **11 Claims**

**1.** A shoulder brace, worn about a person's arm and torso to limit the mobility of the shoulder of the person comprising:
a body belt with fastening means attached about the torso;
a first arm belt attached about the upper arm;
a second arm belt attached about the forearm;
a resilient strap having a first end and a second end, said first end being attached to said body belt; and
and means for connecting said second end to said first arm belt and said second arm belt.

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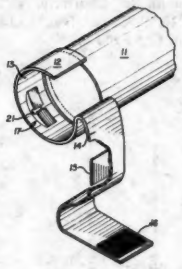
**4,610,245**
**MEDICAL PROTECTIVE SLEEVE**
**Lorraine Biearman, 2871 Mount Troy Rd., Pittsburgh, Pa. 15212**
**Filed Mar. 25, 1985, Ser. No. 715,358**
**Int. Cl.[4] A61F *13/00***
**U.S. Cl. 128—82** **5 Claims**

**1.** In a watertight cover for a human limb comprising a sleeve having at at least one end an adjustable length cuff of resilient material and fastening means therefor adapted to form a watertight seal between limb and sleeve the improvement comprising means at that end for positioning an intravenous feeding tube within the sleeve, said means comprising a fitting of resilient material positioned against the inside surface of said cuff, the fitting being elongated in the circumferential direction



of the cuff, being thicker intermediate its ends than at its ends and having a transverse slot intermediate its ends open on the inside surface of said fitting to a width less than the width of the slot, said slot being adapted to hold an intravenous tube therein.

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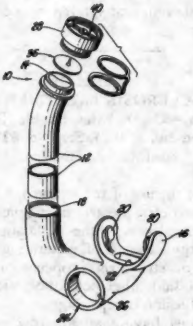
**4,610,246**
**SNORKEL VALVE ASSEMBLY**
**John B. Delphia, 1021 Schuyler Dr., Milford, Mich. 48042**
**Filed Mar. 18, 1985, Ser. No. 712,636**
**Int. Cl.[4] B63C *11/16***
**U.S. Cl. 128—201.11** **14 Claims**



**1.** A diving snorkel assembly **(10)** comprising: a snorkel tube **(12)** having an air inlet at one end **(14)** and a mouth piece **(16)** at the opposite end, said tube **(12)** defining a fluid passageway **(18)** extending between said inlet end **(14)** of said tube **(12)** and said mouth piece **(16)**, said one end **(14)** including a sleeve mounted thereon and **(28)** having a seating rim **(30,30')** defining said air inlet **(32)**; exhaust means **(24)** spaced from said mouthpiece **(16)** and said inlet end **(14)** of said tube **(12)** for allowing one way exhaust of fluid from said fluid passageway **(18)**; and a diaphragm member having a sealing surface **(38)** mounted in said sleeve transverses to such rim and spaced therefrom such that said diaphragm member has a pushed closed position wherein fluid flow within said sleeve **(28)** draws said sealing surface **(38)** of said diaphragm member **(36)** into sealing engagement with said seating rim **(30,30')** and a neutral position when there is no fluid flow within said sleeve **(28)** wherein at least a portion of said sealing surface **(38)** is spaced from said seating rim **(30)**.

## 4,610,247
## COLD WEATHER BREATHING APPARATUS

**Bert R. Stroup, Chula Vista, Calif., assignor to Arctic Temperature Controls, San Diego, Calif.**

**Filed Sep. 20, 1984, Ser. No. 652,262**
**Int. Cl.[4] A62B *7/00***
**U.S. Cl. 128—201.28** **11 Claims**

1. An air heater mask for a wearer, said mask comprising:
a hood of air permeable flexible material with an inner and an outer surface and having a closed upper end and an open lower end adapted to fit over the wearer's head; and
a breathing apparatus secured within said hood and comprising:
a nose piece adapted to enclose the forward part of the wearer's nose, including the nostrils;
air intake means coupled to said nose piece comprising:
an air intake tube with an inward facing side and an outward facing side, said intake tube being secured within said hood such that said outward facing side contacts said inner surface of said hood between said closed end and said open end, said inward facing side of said intake tube is adapted to extend rearwardly in contact with and along the wearer's head beneath the ear; and
air intake means at the rearward end of said intake tube, said intake means being shaped and configured to receive air from the surface of the wearer's head at the warm location behind the ear and having openings in said intake means adapted to be positioned to face and lie closely adjacent the wearer's head;
air exhaust tube means having one end coupled to said nose piece and defining an outlet at the opposite end thereof spaced from said nose piece;
said hood having aperture means for said outlet, said exhaust tube means extending therethrough;
said exhaust tube means between said exhaust outlet and said nose piece surrounding said intake tube to warm incoming air; and
flow directional means providing one way flow through said intake means into said nose piece and through said exhaust tube means from said nose piece.

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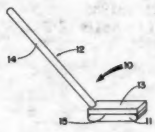
## 4,610,248
## SURGICAL FINGER ASSEMBLY

**Norman Rosenberg, East Brunswick, N.J., assignor to University of Medicine and Dentistry of New Jersey, Newark, N.J.**

**Filed Sep. 18, 1984, Ser. No. 651,791**
**Int. Cl.[4] A61B *17/12***
**U.S. Cl. 128—325** **5 Claims**

1. A surgical finger assembly for direct application to an individual lacerated blood vessel in the depths of a surgical or trauma wound to control the immediate blood loss from the laceration, comprising:
a finger tip member prepared from pliant material, said finger tip member having a first pliant major surface dimensioned to be inserted unobstrusively into said wound, and to make direct contact with said blood vessel, and with a width dimension ranging up to general correspondence to the width of said blood vessel, said finger tip member capable of occluding substantially all of a lacerated area of the blood vessel in a continuous compressive manner; and
an elongated handle having a support section at one end thereof and an elongated handle section extending to the other end thereof, said support section being attached to a



second major surface of said finger tip member and corresponding in size thereto, said second major surface opposite to said first pliant major surface; for applying compressive forces directly against said blood vessel therethrough.

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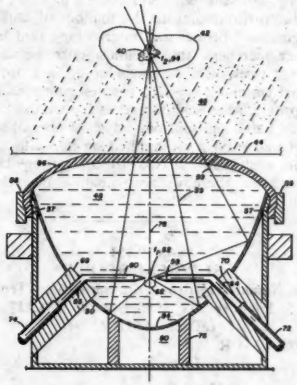
## 4,610,249
## MEANS AND METHOD FOR THE NONINVASIVE FRAGMENTATION OF BODY CONCRETIONS

**Robert A. Makofski, Catonsville; Joe T. Massey, Bethesda; F. Fausten Mark, Silver Spring; Francis B. Weiskopf, Jr., Catonsville; William H. Guier, Pasadena; Patrick C. Walsh, Hunt Valley, and Fray F. Marshall, Ruxton, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.**

**Filed May 8, 1984, Ser. No. 608,114**
**Int. Cl.[4] A61B *17/22***
**U.S. Cl. 128—328** **14 Claims**



1. A device for the noninvasive fragmentation of a concretion within a body of a patient, comprising:
an ultrasonic transducer for locating said concretion;
a reflector comprising a portion of an ellipsoid of revolution with an open end and a closed end, said transducer being attached to said closed end, said reflector having a first focus and a second focus, said transducer being positioned so that an axis of the transducer is coincident with a straight line extending through said first and second foci;
means for positioning said reflector whereby said concretion is located at said second focus;
means for generating a shock wave at said first focus; and
means for acoustically coupling said shock wave from said first focus through a portion of said body to said second

focus whereby said shock wave is concentrated at said concretion.

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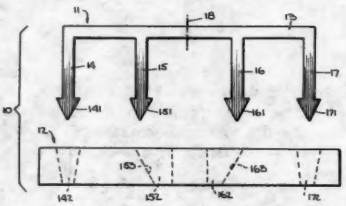
**4,610,250**
**TWO-PART SURGICAL FASTENER FOR FASCIA WOUND APPROXIMATION**
**David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.**
**Filed Oct. 8, 1985, Ser. No. 785,501**
**Int. Cl.[4] A61B *17/04, 17/08***
**U.S. Cl. 128—334 C** **13 Claims**



1. A surgical fastener for joining and approximating the edges of a wound in body tissue, said fastener comprising:

a fastener member including:

an elongated base, and

at least four substantially parallel prongs extending substantially perpendicularly from the base in substantially the same direction, a first one of said prongs being adjacent one end of said base, a second one of said prongs being adjacent the other end of said base, and the remainder of said prongs being spaced inwardly from said first and second prongs; and

a retainer member having a length approximately equal to the length of said base and having a plurality of openings therein corresponding to the number of said prongs for engaging said prongs and interlocking said fastener and retainer members, the openings corresponding to two adjacent ones of said remainder of said prongs having internal camming surfaces for deforming said two adjacent prongs when said fastener is applied to close a wound in body tissue and said two adjacent ones of said remainder of said prongs are applied on opposite sides of said wound, such that said two adjacent prongs bend toward one another, thereby approximating the edges of said wound.

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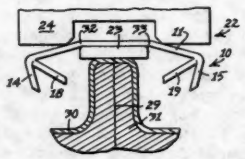
**4,610,251**
**SURGICAL STAPLE**
**Sarbjeet S. Kumar, 514 Brown St., Springfield, Tenn. 37172**
**Filed Apr. 19, 1985, Ser. No. 724,837**
**Int. Cl.[4] A61B *17/04***
**U.S. Cl. 128—334 R** **7 Claims**



1. A surgical staple adapted to be deformed and emplaced in human skin by a surgical staple applicator to join the opposed edges of an incision in the skin of a patient, comprising:

(a) an elongated straight wire-like bridge portion having an inner side and opposite ends, said bridge portion being adapted to transversely span the opposed edges of an incision with said inner side opposing said incision,

(b) said wire-like bridge portion being deformable by a staple applicator,

(c) a pair of wire-like anchor prongs having pointed tips, depending from said inner side and from the corresponding opposite ends of said bridge portion and disposed in substantially the same plane as said bridge portion, each of said anchor prongs being substantially of uniform cross-section and shorter than said bridge portion and being adapted to penetrate the skin on opposite sides of the incision, when the bridge portion is deformed to an operative incision closing position by the applicator,

(d) a pair of wire-like positioning prongs of uniform cross-section depending from said inner side of said wire-like bridge portion in substantially the same plane as said anchor prongs, said positioning prongs having pointed tips spaced closer together than the tips of said anchor prongs so that said positioning prongs penetrate the skin substantially closer to the opposed edges of the incision than the anchor prongs to hold the incision edges together and to prevent rotation of said staple in a transverse plane relative to the incision, when said bridge portion has been deformed to said operative position.

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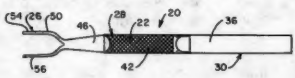
**4,610,252**
**DUAL MUSCLE CLAMP**
**J. Denis Catalano, 609 Claymont Estates Dr., Ballwin, Mo. 63011**
**Filed Oct. 15, 1984, Ser. No. 660,631**
**Int. Cl.[4] A61B *17/00***
**U.S. Cl. 128—346** **12 Claims**



1. An ocular muscle clamp for gripping an eyeball at spaced locations about its periphery, said clamp comprising first and second handle members, each handle member having a forward end and a rearward end;

means connecting said first and second handle members adjacent the rearward ends thereof to enable relative movement of said handle members toward each other and away from each other, said connecting means normally biasing said handle elements away from each other;

first and second U-shaped portions fixed to the respective forward ends of said first and second handle members, each of said U-shaped portions including spaced, elongated first and second legs, each of said first and second legs extending longitudinally in a forward direction and being spaced apart relative to each other so as to be able to contact an eyeball at spaced locations on the periphery thereof, the first and second legs of said first U-shaped portion being positioned in opposed relation respectively to the first and second legs of said second U-shaped portion, said first legs of each of said U-shaped portions defining a first opposed pair of legs and said second legs of each of said U-shaped portions defining a second opposed pair of legs; and

tissue piercing means fixed adjacent to a forward end of at least one leg of each of said opposed pairs of legs and spaced from said handle member, said tissue piercing means including at least one pointed element constructed to pierce tissue of the eyeball, each of said pointed elements projecting generally fowardly from the leg to which said pointed element is fixed and toward the other leg of the respective opposed pair of legs, said pointed element on said one leg of each pair of opposed legs cooperating with the other leg of the respective opposed pair

to grip eyeball tissue therebetween when said first and second handle members are moved toward each other and positioned together thereby gripping eyeball tissue at spaced locations about the periphery of the eyeball.

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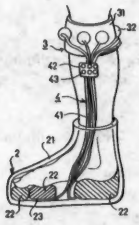
**4,610,253**

## METHOD AND APPARATUS FOR THE PREVENTION OF PRESSURE SORES

**Lior Rosenberg, Omer, Israel, assignor to Brig Research Ltd., Los Angeles, Calif.**

**Filed Aug. 3, 1984, Ser. No. 637,270**
**Claims priority, application Israel, Aug. 19, 1983, 69528**
**Int. Cl.[4] A61N *0/00*; H05C *3/00***
**U.S. Cl. 128—382** **18 Claims**




1. A method for the prevention of pressure sores at a naturally unfeeling part of a person's body, comprising: applying to said unfeeling part of the person's body a pressure-sensor which senses the pressure applied thereto; applying to a feeling part of the person's body a discomfort-generator; and connecting said pressure sensor to said discomfort-generator such that the pressure sensed by said pressure-sensor at the unfeeling part of the person's body is transmitted by said discomfort-generator as a discomfort to the feeling part of the person's body.

6. Apparatus for the prevention of pressure sores at a naturally unfeeling part of a person's body, comprising: a pressure-sensor applicable to said unfeeling part of the person's body for sensing a pressure applied thereto; a discomfort-generator applicable to a feeling part of the person's body; and a connection between said pressure sensor and said discomfort-generator, such that the pressure sensed by said pressure-sensor at the unfeeling part of the person's body is transmitted by said discomfort-generator as a discomfort to the feeling part of the person's body; said pressure-sensor including a plurality of fluid-filled cells for application to the unfeeling part of the person's body at discrete points thereof, and said discomfort-generator including a plurality of other cells applied to discrete points of the feeling part of the person's body and individually connected to said pressure-sensor cells to generate pressures at discrete points of the feeling part of the person's body in response to the pressures sensed at the unfeeling part of the person's body.

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**4,610,254**

## INTERACTIVE PORTABLE DEFIBRILLATOR

**Carlton B. Morgan; Daniel Yerkovich, both of Seattle; Thomas D. Lyster, Redmond and Douglas H. Roberts, Lynnwood, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.**

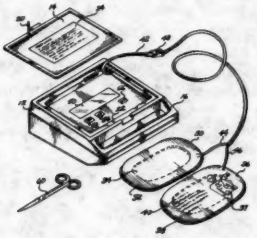
**Filed Mar. 8, 1984, Ser. No. 587,439**
**Int. Cl.[4] A61N *1/36***
**U.S. Cl. 128—419 D** **23 Claims**

1. An interactive medical electronic device for obtaining information about a patient's condition directly from the patient and information pertinent to an analysis of the patient's condition indirectly through an operator of the device, and for producing a medically appropriate action in response thereto, said device comprising:

(a) sensor means for obtaining direct information concerning the condition of the patient;

(b) information processing means, comprising:

(i) interactive communication means including means for obtaining indirect information pertinent to an analysis of the patient's condition from the operator, the means



for obtaining indirect information comprising means for prompting the operator, and means for receiving the operator's response thereto; and

(ii) control means for producing a control signal when said direct and indirect information indicates that the medically appropriate action should be taken; and

(c) output means responsive to the control signal for producing said action upon the patient.

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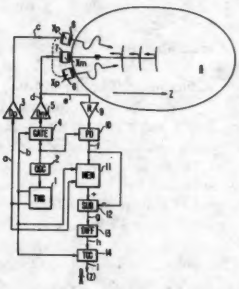
**4,610,255**

## ULTRASONIC NON-LINEAR PARAMETER MEASURING SYSTEM

**Takaki Shimura, Machida; Keiichi Murakami; Hirohide Miwa, both of Kawasaki; Takuso Sato, Shinagawa, and Nobuyuki Ichida, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 28, 1984, Ser. No. 675,612**
**Claims priority, application Japan, Dec. 2, 1983, 58-227949; May 30, 1984, 59-109831**
**Int. Cl.[4] A61B *10/00***
**U.S. Cl. 128—660** **12 Claims**




1. An ultrasonic measuring system for a non-linear parameter of an ultrasonic medium, said system comprising

transmitting and receiving means for transmitting ultrasonic pulses along axis for measurement, for generating and transmitting ultrasonic pulses for pumping, of comparatively lower wave frequency and higher sound pressure than said ultrasonic pulses for measurement, into said medium along substantially the same axis as said ultrasonic pulses for measurement, for receiving ultrasonic waves reflected from said medium corresponding to said ultra-

sonic pulses for measurement, and for providing an output corresponding to each of the respective received ultrasonic reflected waves,

control means for controlling the timing of said transmitting of said ultrasonic pulses for measurement and pumping so that a respective one of said ultrasonic pulses for measurement is superposed on at least one respective predetermined phase of said ultrasonic pulses for pumping,

phase detection means for receiving said output of said transmitting means and for providing an output corresponding to the respective phase of each said reflected ultrasonic wave, and

spatial distribution determining means for providing an output corresponding to a spatial distribution of said nonlinear parameter of said ultrasonic medium along said axis by differentiating said output of said phase detection means.

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**4,610,256**

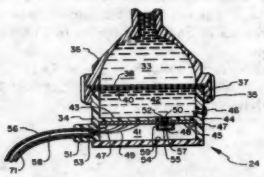
**PRESSURE TRANSDUCER**

**William D. Wallace, Salt Lake City, Utah, assignor to Utah Medical Products, Inc., Midvale, Utah**

**Filed Sep. 25, 1984, Ser. No. 654,373**

**Int. Cl.[4] A61B *5/02***

**U.S. Cl. 128—675** **42 Claims**



**41.** An apparatus for use in a direct blood pressure monitoring system which includes a catheter adapted to be inserted into a patient and connected to liquid-filled tubing for communicating blood pressure pulses through said liquid-filled catheter and tubing to a diaphragm of a pressure transducer, and a monitor for displaying data corresponding to said blood pressure pulses, said apparatus comprising:

a housing comprising a chamber filled with a fluid for transmitting said blood pressure pulses through said chamber, and a cavity disposed adjacent to said chamber, said cavity containing said pressure transducer;

means removably connected to said chamber of said housing for isolating said chamber from said liquid used to fill said pressure tubing and catheter, such that said pressure transducer is adapted for re-use by removing and discarding said isolating means;

means for placing one side of said diaphragm in fluid communication with said blood pressure pulses transmitted through said liquid-filled pressure tubing and catheter;

means for venting the other side of said diaphragm through said cavity to atmospheric pressure; and

means for introducing a calibration pressure into said cavity on the side of said diaphragm that is vented to said atmospheric pressure.

**4,610,257**

**PULSE MEASUREMENT SYSTEM**

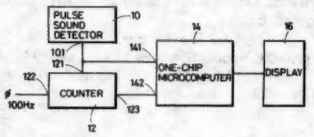
**Toshio Furukawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jun. 6, 1983, Ser. No. 501,246**

**Claims priority, application Japan, Jun. 9, 1982, 57-99910**

**Int. Cl.[4] A61B *5/07***

**U.S. Cl. 128—689** **5 Claims**




**1.** A pulse measurement system comprising:

pulse detecting means for developing a pulse detection signal when a pulse is detected;

counter means for counting a time interval between two adjacent pulses and developing pulse interval data;

first memory means for storing previously determined maximum interval data;

second memory means for storing previously determined minimum interval data;

temporary memory means for temporarily storing new interval data developed from said counter means;

first comparing means for comparing said new interval data with said previously determined maximum interval data stored in said first memory means and applying said new interval data to said first memory means when said maximum interval data is greater than said new interval data derived from said temporary memory means to store updated maximum interval data;

second comparing means for comparing said new interval data with said minimum interval data stored in said second memory means and applying said new interval data to said second memory means when said new interval data is greater than said minimum interval data to store updated minimum interval data;

control means for alternately activating said first comparing means and said second comparing means; and

calculation means for calculating pulse number information in accordance with said updated interval data stored in said first and second memory means.

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**4,610,258**

**METHOD FOR CALCULATING BLOOD FLOW USING FREELY DIFFUSIBLE INERT GASES AND CT**

**James G. Colsher, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.**

**Filed Nov. 13, 1984, Ser. No. 670,594**

**Int. Cl.[4] A61B *5/02***

**U.S. Cl. 128—691** **13 Claims**

**1.** A method of determining blood flow in tissue comprising the steps of

applying a freely diffusible inert gas to said tissue,

obtaining a measure of concentration of said gas in arterial blood as a function of time by breath analysis,

obtaining a measure of concentration of said gas in said tissue as a function of time by CT measurements,

obtaining the values of the blood flow rate constant (k) and partition coefficient (λ) by adopting a functional form for the time behavior of gas concentration, and thereafter successively deriving the said volumes of λ and K from the partial derivatives of the sum of errors squared of the measured tissue concentration less the measured blood concentration, and

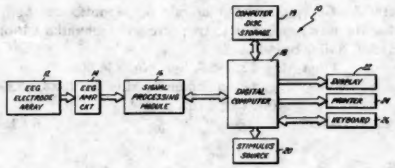
determining blood flow in said tissue using said rate constant (k) and partition coefficient (λ).

## 4,610,259

## EEG SIGNAL ANALYSIS SYSTEM

Daniel E. Cohen, Eden Prairie, and Frederick T. Strobl, Chaska, both of Minn., assignors to CNS, Inc., Eden Prairie, Minn.

Filed Aug. 31, 1983, Ser. No. 527,955
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—731 24 Claims




1. A method of processing an EEG signal to provide an indication of cerebral activity in response to an event, the method comprising:

sampling the EEG signal to produce digital sample values representative of amplitude of the EEG signal as a function of time;

providing a plurality of digitized waveforms which are based at least in part on the digital sample values, which have a first length, and each of which includes fill values surrounding the digital sample values derived from one of a plurality of epochs having different time relationships to the event, each epoch having a second length which is less than the first length;

transforming each digitized waveform from a time domain to a frequency domain to produce a frequency spectrum corresponding to one of the plurality of epochs, each frequency spectrum having frequency components uniquely attributable to the digital sample values derived from its corresponding epoch;

deriving a frequency value for each epoch based upon the frequency spectrum corresponding to that epoch; and

providing an output indicative of cerebral activity based upon the frequency values.

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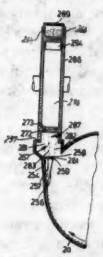
## 4,610,260

## APPARATUS FOR FORMING A TOBACCO STREAM

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,641
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244533
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] A24C 5/18, 5/39
U.S. Cl. 131—84.3 20 Claims



1. Apparatus for forming a continuous tobacco stream in the distributor of a filler forming machine, comprising a conveyor including an air-permeable tobacco advancing element arranged to move in a predetermined direction and having a first side and a second side; suction generating means adjacent to the first side of said element; first and second sidewalls adjacent to the second side of and defining with said element an elongated channel extending in said direction; a source of tobacco particles; a source of compressed air; and means for feeding tobacco particles to said conveyor, comprising means for supplying particles of tobacco from the respective source into said channel so that the particles advance toward and adhere to the second side of said element under the action of said suction generating means, and means for admitting compressed air from the respective source to the particles of tobacco which are about to enter said channel in such quantities that the channel receives more air than can be evacuated therefrom through said air permeable element, at least one of said sidewalls having an air-permeable portion for evacuation of the surplus of air from said channel, said air-permeable portion being recessed in a direction away from the other of said sidewalls so that it is remote from the nearest trajectories of tobacco particles advancing in said channel toward said element and said one sidewall having a second portion which, together with said air-permeable portion defines at least one edge face beyond which the particles of tobacco advance from said tobacco supplying means toward the second side of said element.

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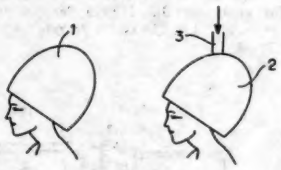
## 4,610,261

## PROCESS FOR TREATING THE HAIR AND IN PARTICULAR THE TIPS OF THE HAIR AND DEVICE FOR CARRYING OUT THE SAID PROCESS

Anniè G. Madrange, Saint German En Laye, and Jean-Louis L. Refregier, Conflans Sainte Honorine, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 11, 1983, Ser. No. 522,216
Claims priority, application France, Aug. 16, 1982, 82 14178
Int. Cl.[4] A45D 7/00
U.S. Cl. 132—7 19 Claims




1. A process for improving the condition and appearance of hair comprising the steps of

(a) subjecting said hair to a dampening treatment; and

(b) subjecting the hair treated in step (a) to a conditioning step during which said hair is maintained in an atmosphere having a relative humidity ranging from about 40 to about 80% and at a temperature ranging from about 35° to about 75° C., said hair not being wound on hair rollers during said conditioning step.

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## 4,610,262

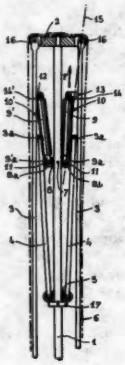
## SYSTEM FOR THE POWER-ASSISTED OPENING OF PARASOLS AND THE LIKE

Julien Broyer, Miribel, and Bernard M. de Marancour, Caluire, both of France, assignors to S.R.P.M.:Societe de Realisation de Productions Metalliques, Miribel, France

Filed Aug. 2, 1985, Ser. No. 761,726
Claims priority, application France, Sep. 4, 1984, 84 13749
Int. Cl.[4] A45B 25/16
U.S. Cl. 135—23 3 Claims

1. A system for the power-assisted opening of parasols and

the like comprising a shaft of which one of the ends is provided with a cap on which ribs are articulated in star-like manner, wherein it comprises at least one compressed air jack, of which the cylinder is articulated on a ring fixed to the shaft, whilst the free end of its piston rod is associated with



a tab fastened to one of the ribs by means such that, when the parasol is closed, the point of fastening of the piston rod of the jack with respect to the tab lies between the shaft and the fictitious line joining the articulation of the rib in question on the cap of the parasol and the axis of articulation of the cylinder of said jack on the ring.

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**4,610,263**

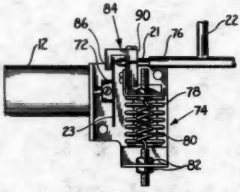
**PNEUMATIC SERVO ASSEMBLY FOR AN ELECTRO PNEUMATIC CONVERTER**

**Christine B. Barnes, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Continuation of Ser. No. 469,200, Feb. 24, 1983, abandoned. This application Jul. 2, 1985, Ser. No. 751,463**

**Int. Cl.[4] G05D *16/00***

**U.S. Cl. 137—85** **6 Claims**



1. A pneumatic servo assembly for an electropneumatic control system comprising:

a pneumatic backpressure nozzle for providing a pneumatic output signal;

a cam shaped movable input restriction for variably blocking the output of said nozzle at substantially the same linear distance therefrom;

electric motor means coupled by a shaft to said cam shaped movable input restriction for rotating said cam shaped movable restriction with respect to said nozzle to variable block said nozzle thereby including a nozzle clamp for eliminating end play in the shaft to maintain a substantially constant distance between said nozzle and said cam shaped restriction;

a bellows assembly connected to said nozzle to expand and contract in response to the pressure from said nozzle; and

said backpressure nozzle and said bellows assembly being attached as a unit to a single pivot point allowing the rotation of both as a unit around said pivot point in response to bellows expansion or contraction.

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**4,610,264**

**HYDRO-AUTOMATIC VALVE FOR THE CONTROL OF BRANCHINGS OF THE DISTRIBUTION PIPING OF A SPRINKLING IRRIGATION SYSTEM ON STEEP GROUNDS**

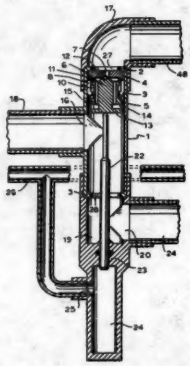
**Vesselin Y. Georgiev, and Vladimir S. Mednikarov, both of Sofia, Bulgaria, assignors to Institute po Mechanika I Biomechanika, Sofia, Bulgaria**

**Filed May 22, 1985, Ser. No. 736,806**

**Claims priority, application Bulgaria, May 22, 1984, 65590**

**Int. Cl.[4] F16K *11/14***

**U.S. Cl. 137—119** **6 Claims**



1. A hydro-automatic valve for the control of water flow to branch piping of the distribution piping of a sprinkling irrigation system comprising:

a cylindrical housing with a lateral inlet hole and outlet elbow from and to a basic distribution piping and a lateral outlet hole towards the branch piping;

a cylinder with piston, wherein the space of the cylinder underneath the piston is connected to an additional control piping of the irrigation system;

wherein the cylindrical housing is mounted vertically, and in each end is provided respectively a rigid upper ring shaped rest and a rigid bottom ring shaped rest, said rests defining coaxial holes;

between said rests, inside the cylindrical housing, there are freely disposed an upper face closure member and a bottom face closure member which are interconnected;

the upper face closure member being shaped as a disc with a hole coaxial to the axis of the cylindrical housing and having, at its periphery, a plurality of small legs extending vertically downwards, which legs end in their bottom end with small teeth turned inside towards the axis;

the small legs are disposed freely in a shallow ring shaped groove in the surrounding surface of the bottom face closure member,

the bottom face closure member has an upward extending conical peak coaxial to the cylindrical housing and defining an annular space between the conical peak and the upper face closure member;

at the bottom end of the bottom face closure member there is a deep ring shaped groove around its outer surface;

the deep ring shaped groove is connected to the annular space between the upper and the bottom face closure member via vertical channels parallel to the axis;

the lateral inlet hole is disposed centrally in the axis and the outlet elbow is disposed above the upper ring shaped rest;

the lateral outlet hole to the branch piping is disposed in a chamber disposed underneath the bottom ring shaped rest;

the cylinder with piston pin is mounted in the bottom of the chamber coaxial with the cylindrical housing; and

the space of this cylinder underneath the piston is connected via a hole with an additional control piping of the irrigation system.

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**4,610,265**

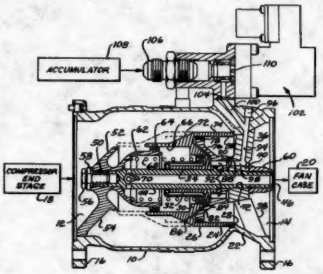
## TURBINE COMPRESSOR STALL RECOVERY VALVE

**Thomas Nelson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Dec. 12, 1984, Ser. No. 682,272**

**Int. Cl.[4] F16K *31/124***

**U.S. Cl. 137—219** **4 Claims**




1. An in-line valve assembly for connection to at least one bleed air port in the compressor section of a turbine engine comprising:

a generally cylindrical valve body having opposed open ends, one of said ends being adapted to serve as an inlet and the other of said ends being adapted to serve as an outlet;

an annular valve seat within said body adjacent said other end;

a sleeve of lesser diameter than said valve body within said valve body and including an annular valve surface adapted to sealingly abut said seat, said sleeve having an internal, generally diametral web intermediate its ends, said web having a central opening;

at least one strut in said body extending generally radially inwardly at a location on the outlet side of said seat;

an axial guide tube mounted on said strut and being directed through said central opening to slidably mount said sleeve for reciprocal movement toward and away from said seat, one end of said tube adjacent said outlet opening to said outlet to be in fluid communication therewith;

a first annular wall mounted on said guide tube at the end thereof remote from said tube one end and slidably sealingly engaging the interior of said sleeve on one side of said web;

compression spring means interposed between said first annular wall and said web for biasing said sleeve toward said seat;

said guide tube opening to the interface between said first annular wall and said web to establish fluid communication between said interface and the interior of said tube, and thus, fluid communication between said interface and said outlet;

a second annular wall on said tube between said seat and said web and slidably, sealingly engaging the interior of said sleeve;

said web and said sleeve and said second annular wall defining a variable volume chamber for receiving a pressure signal adapted to bias said sleeve away from said seat;

a fluid passage in said strut and extending through said second annular wall to be in fluid communication with said chamber;

a three-way control valve having a first port connected to said fluid passage, a second port adapted to be connected to a source of fluid pressure, a third port adapted to be connected to vent, a valve member movable to all alternately establish fluid communication between said first and second ports of said first and third ports, and a valve chamber with opposed seats respectively associated with said second and third ports, said valve member being movable within said valve chamber between said seats with said first port opening to said valve chamber;

a motor for selectively moving said valve member comprising a solenoid having a spring biased armature normally urging said valve member against the seat associated with said second port; and

an accumulator in fluid communication with said second port and constituting said source of fluid pressure.

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**4,610,266**

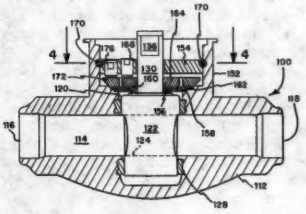
## VALVE ASSEMBLY FOR SECURING A COVER TO A VALVE BODY WITH FASTENERS WHICH ARE FREE OF TENSILE STRESS

**Michael J. Sandling, Cincinnatti, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio**

**Filed Jun. 7, 1985, Ser. No. 742,266**

**Int. Cl.[4] F16K *43/00, 5/04, 41/00***

**U.S. Cl. 137—315** **10 Claims**



1. A valve assembly for securing a valve cover to a valve body with fastening means which are free of tensile stress, comprising:

(a) a valve body, said valve body having an inlet and an outlet and a fluid flow passage extending therebetween;

(b) a valve member movably disposed within the flow passage of said valve body, said valve member being operative to control fluid flow through said flow passage in accordance with the position of said valve member relative to said valve body, said valve body having an access opening for assembling and accessing said valve member;

(c) an actuating shaft affixed to said valve member, said actuating shaft being adapted to mechanically interface with an actuating element positioned external to said valve body for effectuating movement of said valve member within said valve body;

(d) cover means secured to said valve body for covering and sealing said access opening, said cover means including an opening for said actuating shaft;

(e) fastening means for securing said cover means with respect to said valve body, said fastening means including at least one element partially surrounding the cover means; and

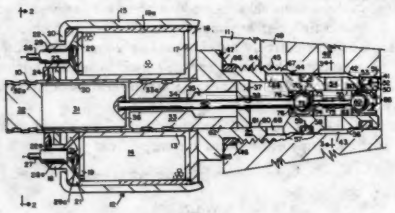
(f) means for adjustably and sealingly closing said access opening with said cover means without the application of tensile stress to the fastening means, said closing means being operative to apply a varying compressive force to said cover means for compressing the fastening means.

4,610,267

## FAST RESPONSE SOLENOID VALVE

Niels J. Beck; Edward T. Gilbert, both of Bonita; William E. Weseloh, and Kenneth Rudolph, both of San Diego, all of Calif., assignors to Orshansky Transmission Corporation, San Diego, Calif.

Filed Aug. 25, 1982, Ser. No. 411,298
Int. Cl.[4] F16K *51/00, 31/02*
U.S. Cl. 137—329.3 19 Claims



1. A fast-response solenoid valve having a body with a plurality of successive separated openings inter-connected by a linear fluid pathway having at least one chamber lying between successive pairs of openings, said chamber having a movable ball and a ball seat, said valve also having a solenoid with a coil, a plunger which moves upon energization of the solenoid, a passage between said plunger and said ball, and a plunger pin in said passage with one end bearing against said ball, and its other end moved by said plunger when said solenoid is energized, movement of said plunger upon the energization of said solenoid causing said plunger pin to move said ball, said valve comprising:

a ball cage having a cylindrical exterior wall in snug engagement with the wall of said linear fluid passageway, a seat at one end, and a retaining portion at the other end,

said ball being retained in one said cage for limited axial movement between a said seat and a said retaining portion,

a cylindrical non-magnetic tube with an outer wall and an inner wall aligned with said linear fluid pathway, one end of said tube abutting a portion of said body, said tube having a distal end also,

a non-magnetic end plug held at a fixed position in said tube at its distal end, and

a magnetic guide plug held at a fixed position in said tube spaced away from said end plug and having a small-diameter hole therethrough providing said passage,

said solenoid plunger being in said tube and movable in between said plugs, and said plunger pin being in connection with said plunger.

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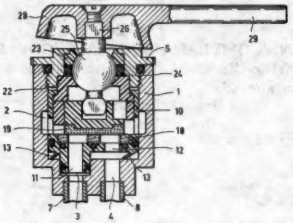
4,610,268

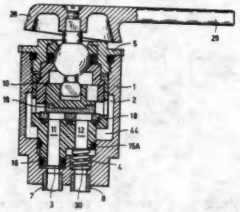
## MIXER VALVE WITH HARD MATERIAL PLAQUES, HAVING A MOVABLE CARTRIDGE LOADED BY THE WATER PRESSURE

Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany, assignor to Gevipi A.G., Vaduz, Liechtenstein

Filed Apr. 18, 1985, Ser. No. 725,133
Claims priority, application Italy, May 9, 1984, 67464 A/84; May 25, 1984, 67530 A/84
Int. Cl.[4] F16K *11/078, 25/00*
U.S. Cl. 137—454.6 15 Claims

1. A mixer valve comprising a valve body having at least one bore and a bottom, a cover closing said valve body opposite said bottom, seatings provided in said bottom of the valve body, two water inlet pipes connected to said seatings, a delivery union connected to said valve body, control means applied to said valve body, a changeable cartridge having an envelope inserted into said valve body with an axial clearance, a hard material fixed plaque mounted in said cartridge, at least one movable plaque housed in said cartridge, connected to the control means and intended to cooperate with said fixed plaque for carrying out the regulation of the flow rate and the mixing ratio, said cartridge having near its bottom end a peripheral sealing gasket intended to radially seal into a corresponding bore of the valve body, a sealing union inserted between said cartridge and one of said seatings of the valve body communicating with one of said water inlet pipes, the other water inlet





pipe directly communicating with the bottom portion of said bore of the valve body, and the remaining portion of said bore of the valve body communicating with said delivery union; whereby the pressure of said other water inlet pipe, present within the bottom portion of the valve body, acts onto the cartridge as onto a piston, thus applying to the plaques a force which increases with increasing feeding pressure.

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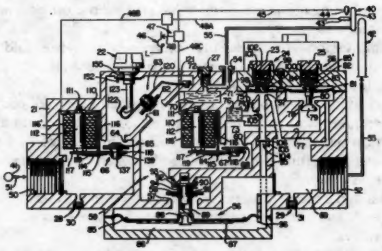
4,610,269

## FUEL CONTROL VALVE CONSTRUCTION

Samuel T. Kelly, Torrance, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 613,462, May 24, 1984, Pat. No. 4,549,571.
This application Aug. 16, 1985, Ser. No. 766,204
The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.
Int. Cl.[4] F16K *31/365*
U.S. Cl. 137—489.5 8 Claims



5. A fuel control valve construction as set forth in claim 4 wherein said housing means has a third valve unit for opening

and closing said passage means intermediate said inlet means and said other valve unit.

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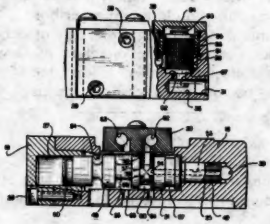
4,610,270

## PILOT-OPERATED VALVE WITH INTEGRAL FILTER

Richard C. Acker, Chagrin Falls, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 566,191, Dec. 28, 1983, abandoned. This application Sep. 11, 1985, Ser. No. 775,095
Int. Cl.[4] F16K *31/122*; B01D *27/10*
U.S. Cl. 137—549 3 Claims



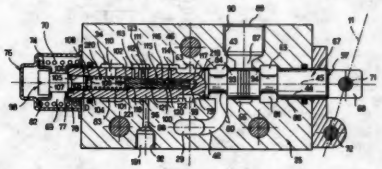
1. A fluid control circuit including a pilot-operated directional control valve and a master control valve for shifting the directional control valve, the master control valve and directional control valve having separate bodies remote from one another and being interconnected by a pair of external fluid lines coupled to external ports on the directional control valve body, one of said lines being a pilot line directing fluid from said master valve received from the other of said lines to said directional control valve, the master valve being selectively operable between two positions, in one of said positions said master control valve applying fluid pressure to said pilot line and in the other position exhausting said pilot line, said directional control valve having an inlet including means for coupling with an external supply line and a manifold in its body communicating with said inlet, said other line being connected to and being supplied by one of said ports directly from said manifold, filter means having a cup-shape and being disposed in a cavity in said body, the inlet being arranged upstream of the filter to receive incoming fluid in a first direction from the supply line, said body including an integral annular seat in a plane transverse to a second direction generally at a right angle to said first direction, the open end of said cup-shaped filter means abutting said seat, the filter means being arranged to receive fluid in the interior of its cup-shape through a center area of said seat along said second direction, said filter means being interposed between said inlet and said manifold in a manner whereby said filter means is adapted to filter fluid operating in both said directional control valve and the remote master control valve, a plug remote from said inlet in threaded engagement with said body and retaining said filter in said cavity, a compression spring interposed between said plug and said filter means resiliently biasing said filter means against said seat, said spring being constructed and arranged to allow said filter means to be displaced from said seat when a predetermined pressure drop occurs across said filter means, the manifold being arranged to conduct fluid from the filter means in a direction generally at a right angle to said second direction directly to said one port.

4,610,271

## HIGH PRESSURE HYDRAULIC DISTRIBUTOR

Clifford J. Balmer, St Germain-en-Laye, and Richard Goddard, Senlis, both of France, assignors to Vickers Systems S.A., Saint Quen l'Aumone, France

Filed Aug. 8, 1985, Ser. No. 763,809
Claims priority, application France, Aug. 31, 1984, 84 13505
Int. Cl.[4] F15B *13/02*
U.S. Cl. 137—596.13 15 Claims



1. In a hydraulic distributor of the type comprising at least one inlet duct able to be connected to a source of hydraulic fluid under high pressure, at least one principal outlet duct able to be connected to utilisation means of hydraulic fluid under high pressure, at least one return duct able to be connected to a reservoir of hydraulic fluid under low pressure, and distributor means able to occupy several conditions in which it establishes or interrupts hydraulic connections between certain of said ducts, and in particular at least one passive condition in which said distributor means establishes a hydraulic connection between said inlet duct and said return duct interrupting any hydraulic connection between said inlet duct and said principal outlet duct, and at least one active condition in which said distributor means establishes a hydraulic connection between said inlet duct and said principal outlet duct interrupting any hydraulic connection between said inlet duct and said return duct, the improvement comprising:

an auxiliary outlet duct;

pressure reducing means, sensitive to the hydraulic pressure in said inlet duct, for establishing a hydraulic connection between said inlet duct and said auxiliary outlet duct:

when the value of the hydraulic pressure in said inlet duct exceeds a predetermined threshold, and then causes the appearance, in said auxiliary outlet duct, of a hydraulic pilot pressure of a reduced value with respect to the value of hydraulic pressure in said inlet duct,

when the value of the hydraulic pressure in said inlet duct is below the said threshold, and to transmit this pressure to said auxiliary outlet,

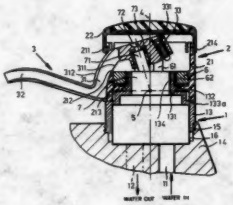
the said threshold being on the one hand greater than a maximum value of hydraulic pressure in said inlet duct when said distributor means occupies a passive condition and said inlet duct and said return duct are respectively connected to the source and to the reservoir, and on the other hand lower than a minimum value of hydraulic pressure in said inlet duct when said distributor means occupies an active condition and said inlet duct and said principal outlet duct are respectively connected to the source and to the utilisation means; and

modulation means, coupled to said distributor means, for modulating the value of the hydraulic pilot pressure in a predetermined manner, as a function of the condition of said distributor means.

## 4,610,272
## ACTUATING DEVICE FOR A MIXING VALVE

Adolf Gottwald, Iserlohn, and Wilfried Köster, Menden, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,215
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337968
Int. Cl.[4] E03C 1/01
U.S. Cl. 137—625.17 10 Claims



1. An actuating device for a control and mixing valve, comprising:

a valve body provided with a rotatable valve housing;

a valve mechanism in said housing and said body and including a movable valve member pivotal about a first axis and a second axis perpendicular to said first axis, said movable member being enclosed by said valve housing, said valve housing being formed with a lateral opening; and

a hand lever having;

a grip,

a portion lying within said housing,

means connecting said portion to said member for pivoting said member about said first axis,

and a bend between said portion and said grip corresponding to a circular arc centered on said second axis, extending through said opening and blocking said opening in all positions of said lever about said second axis, said valve housing being formed as a cap covering said portion and having a downwardly extending external wall surrounding said member and formed with said opening, said cap being rotatable on said body with said lever about said first axis.

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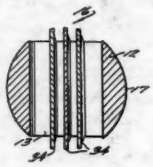
## 4,610,273
## ATTENUATED ROTATING VALVE

Roger Bey, 19, Rue des Rossignols, 68110 Illzach, France

Division of Ser. No. 103,182, Dec. 11, 1979, Pat. No. 4,530,375.
This application Nov. 26, 1984, Ser. No. 674,674
Claims priority, application Finland, Jan. 10, 1979, 790084
Int. Cl.[4] F16K 47/04, 5/10
U.S. Cl. 137—625.32 4 Claims



1. An attenuator valve assembly comprising: a valve body having a flow passage formed therethrough; a closure member having a regular curved exterior surface and having a single elongated bore formed therethrough; means for mounting said closure member in said valve body for rotation about an axis with respect to said valve body to an between an open position wherein said bore is substantially in-line with said flow passage, and a closed position wherein said bore is substantially perpendicular to said flow passage; said closure member bore having a predetermined height in the dimension of said closure member axis of rotation, and a predetermined length in the dimension of elongation thereof; sealing means provided in said valve body flow passage for operatively engaging said closure member curved exterior surface and for preventing fluid passage through said flow passage except through said closure member bore;

means for attenuating fluid flowing through said closure member bore in either direction without significantly restricting flow when said closure member is in said open position, said means comprising perforated barrier means mounted in said closure member bore, said barrier means spanning substantially entirely said bore predetermined height and extending outwardly from either end of said bore to points substantially on a geometric extension of said curved exterior surface of said closure member, and said barrier means comprising a perforated curved element mounted in said closure member bore;

said barrier means comprising a plurality of curved perforated plates curved in the direction of flow of fluid through said closure member, at least one of said perforated plates comprising at least one screen.

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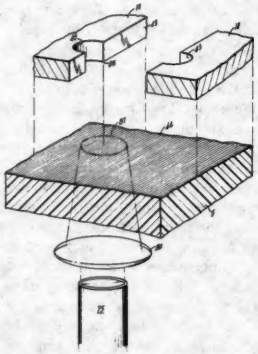
## 4,610,274
## FLUIDIC DEVICE

Walter L. Glomb, Jr., and James P. Waters, both of Ellington, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 4, 1985, Ser. No. 741,045
Int. Cl.[4] F15C 1/04
U.S. Cl. 137—828 7 Claims



1. In a fluidic device accommodating a continuous fluid flow therethrough, said fluidic device comprising a supply nozzle and at least one outlet port, a desired output of said fluidic device, defined by flow conditions at said outlet port, being attained by the input of a control signal to said fluid flow for regulating the flow conditions thereof, the improvement characterized by:

said fluidic device including a passage disposed upstream of said outlet port, and accommodating said fluid flow, said passage comprising a wall structure, at least a portion which is formed from an optically absorbent material; and

means for effecting controlled separation of the boundary layer of said fluid flow from said wall structure by the application of a focused optical input signal to a discrete location on said optically absorbent wall portion, thereby heating an area of said wall structure proximally thereto,

to deflect said fluid flow at said heated area and cause said imbalance in flow conditions between said outlet ports.

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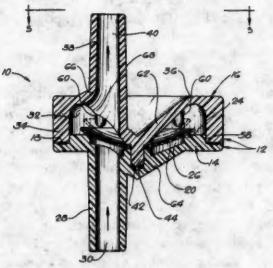
**4,610,275**

## VALVE FOR RELIEVING PRESSURE OR CHECKING REVERSE FLOW

**William H. Beecher, 292 Boyd Ave., Elmhurst, Ill. 60126**

**Filed Nov. 4, 1985, Ser. No. 794,517**
**Int. Cl.[4] F16K *15/14***
**U.S. Cl. 137—854** **14 Claims**



1. A valve for relieving pressure or checking reverse flow,
such valve comprising a valve body including first and second mating body members which are generally circular in cross-section,
the first body member having an inlet cavity with an annular valve seat surrounding the cavity,
the body members having mating pin and socket formations disposed axially thereon,
a flexible resilient valve disc having a central opening for sealingly receiving the pin formation whereby the pin formation retains the valve disc,
the valve disc having an outer portion which initially is in sealing engagement with the annular valve seat,
the body members having annular shoulder means around the pin and socket formations for engaging the valve disc,
the annular shoulder means being recessed into the inlet cavity for deflecting the valve disc into a cupped shape whereby the central portion of the valve disc is deflected into the inlet cavity while the outer portion of the valve disc is resiliently biased against the annular valve seat,
the second body member having an outlet chamber therein for receiving the valve disc,
a tubular inlet connection on the first body member and forming an inlet passage communicating with the inlet cavity,
the tubular inlet connection being offset in a radially outward direction from the axial pin and socket formations,
and a tubular outlet connection on the second body member and forming an outlet passage communicating with the outlet chamber,
the tubular outlet connection being offset in a radially outward direction from the axial pin and socket formations and being aligned with the tubular inlet formation.

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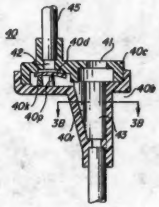
**4,610,276**

## DIRECTIONAL FLOW CONTROL

**Joseph R. Paradis, and Edward W. Kaleskas, both of Holden, Mass., assignors to Nypro Inc., Clinton, Mass.**

**Filed Sep. 29, 1982, Ser. No. 427,484**
**Int. Cl.[4] F16K *15/16***
**U.S. Cl. 137—856** **8 Claims**

1. A flow control device which comprises
a main channel for the throughflow of fluid;
a branch channel connected to said main channel at an intermediate position thereof for the convergence of flow through said main channel with flow through said branch channel; and
means at the convergence of the two channels for controlling the flow therebetween comprising a diaphragm which is bowed under pressure into the inlet of said branch channel;
whereby the application of pressure to said diaphragm assures the sealing of said branch channel against flow diverted from said main channel;



said apparatus having a common housing for said main flow channel and said branch flow channel, wherein said diaphragm is bowed into said branch channel by a set of prongs having tips that extend as projections from a shelf that is common to the branch and main channels and is transverse to the axis of said branch channel;
wherein the bowing of said diaphragm is asymmetric and greater pressure applied thereby away from the region of outflow from said branch channel.

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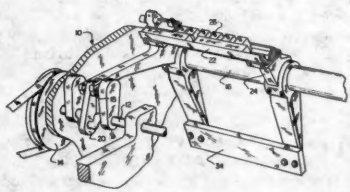
**4,610,277**

## COUNTERBALANCED LAY MOTION FOR HIGH SPEED WEAVING LOOMS

**Alvan A. Krause, Greensboro, N.C., assignor to Draper Corporation, Greensboro, N.C.**

**Filed Apr. 15, 1985, Ser. No. 723,485**
**Int. Cl.[4] D03D *49/60***
**U.S. Cl. 139—191** **4 Claims**



1. In a high speed weaving loom of the type which includes an oscillating rocker shaft, a lay attached to and extending upwardly from said rocker shaft along substantially the entire length thereof in spaced parallel arrangement thereto, and a coupling means connecting the main crankshaft of said loom with said lay for imparting a reciprocatory oscillating motion thereto about the axis of said rocker shaft, the improvement comprising a counterbalance means suspended by brackets from said rocker shaft at points axially spaced therealong and in spaced parallel arrangement to the axis of said rocker shaft, and brackets being so attached to said rocker shaft as to connect said counterbalance means in fixed, non-rotatable relation with respect to and substantially diametrically opposite said lay, said counterbalance means being of such size and so connected to the rocker shaft that the center of gravity of the lay, reed, counterbalance means, and all other components that reciprocatorily oscillate about the axis of said rocker shaft lie substantially on the axis of rotation of said rocker shaft,

whereby vibrations normally transmitted to the loom are minimized.

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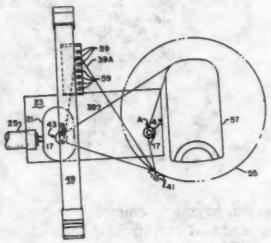
**4,610,278**

## VARIABLE LEAD LENGTH ASSEMBLY

**Billy L. Damon, and Andrew J. Kliethermes, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Aug. 26, 1985, Ser. No. 769,561**
**Int. Cl.[4] B21F *11/00***
**U.S. Cl. 140—92.1** **10 Claims**



**1.** In a machine for winding electric motor coils, said machine having at least one coil winding form and means for winding magnet wire around the form to create an electric motor coil, the improvement comprising:

an adjustable wire cutoff assembly slidingly engageable with the wire fed from the winding means intermediate the winding means and the coil winding form;

means for moving the adjustable wire cutoff assembly away from the coil winding form while wire is being fed through the winding means and is engaged by the wire cutoff assembly, thereby increasing the length of the lead extending from the form to the cutoff assembly over the length it would have if the cutoff assembly were not so moved;

means for presetting the position to which the moving means moves the adjustable wire cutoff assembly so that leads of various lengths can readily be formed on the same coil winding machine; and

means for actuating the adjustable wire cutoff assembly once the assembly reaches said preset position to cut the wire to form a lead of predetermined length.

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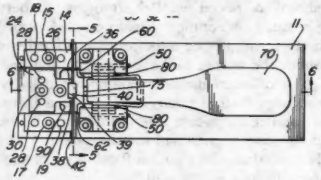
**4,610,279**

## METHOD AND APPARATUS FOR CUTTING AND BENDING RESISTOR LEADS OR THE LIKE

**Jack D. Stewart, Furlong, Pa., assignor to Stewart Enterprises, Inc., Furlong, Pa.**

**Filed Oct. 22, 1984, Ser. No. 663,671**
**Int. Cl.[4] B21F *45/00***
**U.S. Cl. 140—105** **7 Claims**



**1.** A hand-operated cutter-bender for cutting and bending round resistor leads or the like into a right angle configuration which comprises:

a base adapted to be supported in a horizontal position,

a pair of cutter members fixedly mounted on said base to provide cutting edges in spaced apart relation,

a nest member fixedly mounted on said base between said spaced apart cutting edges, said nest member having a pair of bend portions defining the desired bent shape of the resistor leads to be operated on, and a third portion defining a recess for receiving the cylindrical body of the resistor to be operated on, said third portion extending between said bend portions,

means for supporting a resistor with its cylindrical body at least partially received in said recess of said third portion of said nest member and with the axially extending leads thereof extending adjacent said bend portion of said nest member and across said cutting edges in preparation for a cutting and bending operation,

a cutter-bender member mounted for movement across the top surface of said base from a start position to an actuated position, said cutter-bender member having a pair of spaced apart cutter portions aligned with said fixed cutting edges and a pair of bend portions aligned with said pair of bend portions of said nest member, and

means for actuating said cutter-bender member through an operating movement from said start position to said actuated position and to a stop position by means of a handle mounted for pivotal movement on said base including a pin carried by said handle and received in a slot in said cutter-bender member, said parts being constructed and arranged so that as said cutter-bender member moves away from said start position the cutter portions thereof will initially cooperate with said fixed cutting edges to cut the resistor leads and so that at a subsequent portion of said operating movement said bend portions of said cutter-bender member will cooperate with said bend portions of said nest member to bend the cut leads from the axially extending position thereof to the desired right angle configuration.

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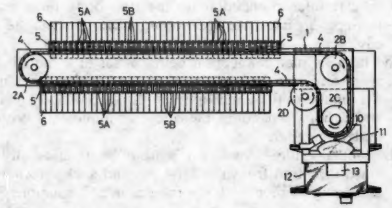
**4,610,280**

## METHOD OF AND APPARATUS FOR SUPPLYING AND TRANSFERRING ELECTRONIC COMPONENTS

**Hiroshi Yagi, and Yoshio Harada, both of Tokyo, Japan, assignors to TDK Corporation, Japan**

**Filed Nov. 21, 1983, Ser. No. 553,681**
**Claims priority, application Japan, Nov. 24, 1982, 57-204622; Dec. 16, 1982, 57-190426[U]; Feb. 21, 1983, 58-23049[U]; Mar. 10, 1983, 58-33563[U]; Apr. 11, 1983, 58-52745[U]**
**Int. Cl.[4] H05K *3/32, 13/02***
**U.S. Cl. 140—105** **15 Claims**



**1.** In a machine for processing and inserting electronic components having leads from electronic component web carriers into lead receiving openings in a printed circuit board, supply and transfer means for selectively supplying a radial lead type electronic component and a coaxial lead type electronic component at a first position and transferring said radial and coaxial lead type electronic components to a second predetermined position, said supply and transfer means comprising

a plurality of pallets, each for receiving and holding one of said radial and coaxial lead type electronic components, each of said pallets including a pallet base, component

holding means pivotally mounted on said pallet base for holding said radial lead type elctronic component, and component receiving means affixed to said pallet base for receiving said coaxial lead type electronic component;

endless conveying means for conveying said pallet between said first position and said second position in an intermittent fashion in a substantially horizontal plane, and having a curvilinear portion thereof;

supply means for selectively supplying the radial and and coaxial lead type electronic components to said pallets at said first position; and

radial lead type electronic component attitude control means for controlling said radial lead type electronic component held by said component holding means of said pallet to be in a fixed attitude when passing over said curvilinear portion of said conveyor means.

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**4,610,281**

## APPARATUS FOR STRAIGHTENING AND SEVERING ROD-LIKE MATERIALS

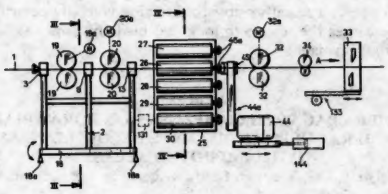
**Ernst Fuchs, Schmerikon; Eduard Berger, Degersheim, and Karl Fitzi, Hombrechtikon, all of Switzerland, assignors to Mecapec S.A., Schmerikon, Switzerland**

**Filed Oct. 24, 1984, Ser. No. 664,345**

**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338915**

**Int. Cl.[4] B21F *1/02***

**U.S. Cl. 140—140** **20 Claims**



1. Apparatus for straightening and severing substantially rod-shaped material, particularly for straightening metallic wire or rod stock and for subdividing the straightened stock into sections of desired length as said material passes along a predetermined path from an upstream source, comprising means for advancing rod-shaped material in a predetermined direction and along said predetermined path having an inlet; several sources of rod-shaped material, said sources being adjacent said inlet; a plurality of mobile guide means downstream of said sources, one for each of said sources and each arranged to guide the material issuing from the respective source; means connected to said guide means for moving selected guide means into register with said advancing means in a first portion of said path adjacent said inlet; straightening means downstream of said guide means including a pluality of independently operable straightening devices, one for each of said sources and each arranged to straighten the material issuing from the respective source, means connected to said straightening devices for positioning selected straightening devices in a second portion of said path downstream of said first portion, as considered in said direction, so that the selected device straightens material issuing from the respective source and passing through the corresponding guide means in said first portion of said path; and means for severing the straightened material in a third portion of said path downstream of said second portion.

**4,610,282**

## LIQUID CARBONATING APPARATUS

**Graham L. Brooks; Antony F. Pateman; Michael A. Thomson, all of Peterborough, and John Scott, Huntingdon, all of England, assignors to Sodastream Limited, Woodston, England**

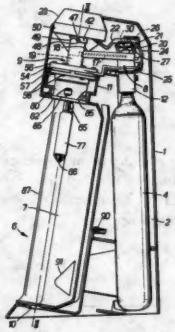
**PCT No. PCT/GB84/00115, § 371 Date Nov. 27, 1984, § 102(e) Date Nov. 27, 1984, PCT Pub. No. WO84/04024, PCT Pub. Date Oct. 25, 1984**

**PCT Filed Apr. 3, 1984, Ser. No. 678,544**

**Claims priority, application United Kingdom, Apr. 8, 1983, 8309627; Sep. 2, 1983, 8323594; Nov. 21, 1983, 8331000**

**Int. Cl.[4] B65B *3/04***

**U.S. Cl. 141—46** **38 Claims**



1. An apparatus for carbonating liquid contained in a bottle having a neck, comprising sealing means for engaging and sealing the neck of the bottle, gas supply means, gas injecting means connected to the gas supply means and projecting downwardly from the sealing means for injecting gas into the liquid, support means for supporting the bottle in a predetermined position with the neck of the bottle uppermost and adjacent to said sealing means, the gas injecting means being arranged to extend down into the liquid in the bottle when the bottle is supported by the support means, movable wall means carryiing the sealing means, a chamber defined on the side of the movable wall means remote from the sealing means, wall displacing means operable to displace the movable wall means and the sealing means downwardly for moving the sealing means either before or as gas is first injected into the bottle, from a position spaced above the bottle neck to a position of firm sealing engagement with said neck.

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**4,610,283**

## CHECKING AND FILLING DEVICE FOR POWDER EXTINGUISHERS

**Bernhard Stöffler, Gärtringen, Fed. Rep. of Germany, assignor to Vulkan-Werk Wilhelm Diebold, Fed. Rep. of Germany**

**Filed Apr. 2, 1984, Ser. No. 596,035**

**Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315893**

**Int. Cl.[4] B65B *1/16, 3/28***

**U.S. Cl. 141—89** **14 Claims**

1. A checking and filling device for powder extinguishers, comprising:

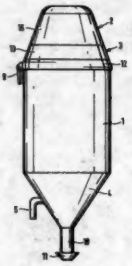
a suction fan having a suction side and a pressure side;

a separator having a filter with an inlet side for accumulating powder and an outlet side, the separator also having a receptacle area for retaining extinguishing powder;

a reversing device comprising a rotary slide valve having movable selectable connections for the separator and the suction side and the pressure side of the suction fan, the reversing device being operable to alternately connect the suction fan to the outlet side of the filter whereby a direc-

tion of continuous air flow is reversed by operating the reversing device; and,

a reversing filter independent of the first filter, disposed between the suction fan and the separator, the reversing



filter removing powder from the reversed air, whereby air is blown backwards through the reversing filter in the reversing operation for cleaning said reversing filter by a delayed pressure drop.

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**4,610,284**

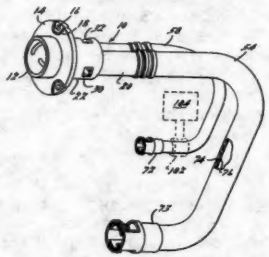
**AUTOMOTIVE FUEL FILLER SYSTEM**

**Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Southfield, Mich.**

**Filed Nov. 6, 1984, Ser. No. 668,763**

**Int. Cl.[4] B65B *3/04***

**U.S. Cl. 141—302** **16 Claims**



**10.** A fuel filling system for dispensing fuel from a dispensing nozzle into the fuel tank of an automotive vehicle comprising:

an inlet housing for receiving said dispensing nozzle;

a fuel delivery pipe and a vent pipe both coupled to said inlet housing;

a first check valve means for coupling said fuel delivery pipe to said fuel tank, said first check valve being biased normally closed and operable in response to fluid pressures within said fuel delivery pipe to open and permit fluid flow into said tank;

a second check valve means for coupling said vent pipe to said fuel tank, said second check valve being biased normally closed and operable in response to fluid pressures within said fuel tank to open and permit fluid flow into said vent pipe.

**4,610,285**

**CUTTING TOOL WITH REMOVABLE BLADES**

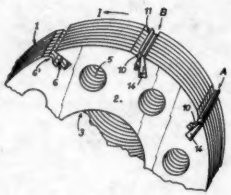
**Charles Derivaz, La Tour-De-Peilz, Switzerland, assignor to Samvaz S.A., Fenil-Sur-Vevey, Switzerland**

**Continuation of Ser. No. 574,141, Jan. 26, 1984, abandoned. This application Sep. 13, 1985, Ser. No. 775,700**

**Claims priority, application Switzerland, Feb. 9, 1983, 720/83**

**Int. Cl.[4] B27G *13/00***

**U.S. Cl. 144—231** **8 Claims**



**1.** Cutting tool with removable blades, comprising a stack of discs each having at least a cut opened on its periphery, and clamping means compressing the stack of discs, the angular position of the discs relative to each other being such that, in working position, the cuts form at least one peripheral longitudinal housing, and at least a blade, the cutting edge of which is situated on a diameter longer than the external diameter of the discs, fixed in at least one of the housings by means of a locking element disposed in said housing parallel to said blade, the size of the cut being such that the blade and the locking element can be introduced with clearance in the longitudinal housing formed by the cut, the locking element being an elongated wedge which bears against the blade when the tool is rotated, the wedge having each means including wedge surfaces that converge in a radially outward direction whereby centrifugal force causes the wedge to lock said blade by jamming when the tool is rotated.

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**4,610,286**

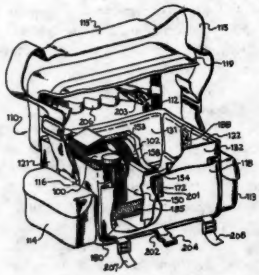
**CAMERA BAG WITH COMPENSATION FOR VARIABLE CAMERA-SUPPORT DISTANCE BELOW LENS, AND WITH IMPROVED ACCESS**

**Jesselyn T. Cyr, Tarzana, Calif., assignor to Tamrac, Inc., Van Nuys, Calif.**

**Continuation of Ser. No. 585,895, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 378,427, May 14, 1982, abandoned. This application Nov. 4, 1985, Ser. No. 794,337**

**Int. Cl.[4] A45C *11/38*; B65D *30/22***

**U.S. Cl. 150—52 J** **25 Claims**



**1.** A camera bag for holding photographic equipment, and particularly adapted for containing and supporting a camera which has a body and which has a generally cylindrical lens protruding laterally from the body and which may or may not also have an automatic film winder attached below the body,

such film winders having nonstandardized heights, so that the supportable undersurface of such camera is in effect a variable distance below such lens; said camera bag comprising:

four substantially vertical walls defining an internal compartment of generally rectangular plan, open at the top;

a substantially vertical transverse partition secured across the width of the compartment near one end wall thereof, and a cutout defined in the top of the partition for closely receiving and supporting such a protruding lens so that such lens may be lifted vertically out of the cutout and removed with such camera through the open top of the compartment; and

means for firmly but adjustably supporting such a camera body immediately adjacent to the partition in such a way that the centerline of such lens is substantially horizontal regardless of whether there is or is not such an automatic winder attached below such camera body and regardless of the height of such an automatic winder; said supporting means being adapted to permit such lens to be lifted vertically out of the cutout, and to permit such camera and lens to be removed together through the open top of the compartment.

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4,610,287

## METHOD AND APPARATUS FOR DEMOUNTING PNEUMATIC VEHICLE TIRES

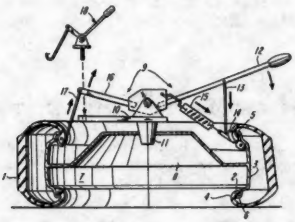
**Heinz-Dieter Rach, Garbsen; Udo Frerichs, Langenhagen; Hans-Ulrich Klose, Wiedensahl, and Carsten Boltze, Barsinghausen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany**

**Filed Jul. 23, 1985, Ser. No. 758,168**

**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3428010**

**Int. Cl.⁴ B60C *25/06***

**U.S. Cl. 157—1.17** **10 Claims**



**4.** An apparatus for demounting a pneumatic vehicle tire, the beads of which, in the mounted state, are disposed on the radially inner periphery of a wheel rim having a deep mounting bed and, laterally outwardly therefrom, rim flanges which extend essentially radially inwardly; said apparatus comprises:

first means for forcing a portion of one of said tire beads into said deep mounting bed; and

second means for lifting the oppositely located portion of the same tire bead over the associated rim flange.

4,610,288

## APPARATUS FOR MOUNTING PNEUMATIC VEHICLE TIRES

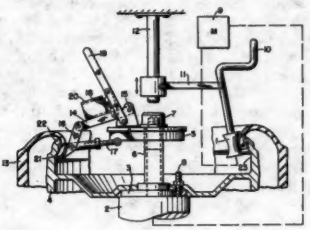
**Heinrich Huinink, Garbsen; Hans Seitz, Langenhagen; Heinz-Dieter Rach, Garbsen, and Udo Frerichs, Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Fed. Rep. of Germany**

**Filed Sep. 21, 1984, Ser. No. 653,493**

**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 334203221**

**Int. Cl.⁴ B60C *25/08***

**U.S. Cl. 157—1.22** **9 Claims**



**1.** An apparatus for mounting a pneumatic vehicle tire, the beads of which, in the mounted state, are disposed on the radially inner periphery of a wheel rim having a recessed portion; the apparatus comprising:

mounting means which, after the introduction of a portion of one of said beads of said tire into said recessed portion, fixes said bead portion; and

a motor driven roller, which at the start of operation engages with radial as well as tangential forces in the vicinity of said fixed bead portion of said tire and is then movable over the remainder of said bead portion; the circumferential speed of said motor driven roller being greater than the rolling speed on said tire.

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4,610,289

## SHUTTER

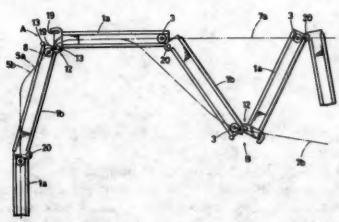
**Toshihiko Sugihara, Mihara, Japan, assignor to Kyoritsu Kikai Company, Hiroshima, Japan**

**Filed Aug. 3, 1984, Ser. No. 637,402**

**Claims priority, application Japan, Aug. 4, 1983, 58-143334; Oct. 31, 1983, 58-205075; Nov. 30, 1983, 58-227612; Jan. 23, 1984, 59-010869**

**Int. Cl.⁴ E06B *9/00***

**U.S. Cl. 160—35** **11 Claims**



**1.** A two-way hinged assembly comprising

(a) two abutting members, said members rotating about respective axes defined by edges of surfaces along which said members abut thereby permitting the rotation of one of said members in either direction with respect to said other member at said abutting surface until said members interfere with each other;

(b) a pair of pin members connected to end portions of one of said abutting members, said pin members extending substantially parallel to one another and substantially coaxial with said axes; and

(c) a female member for receiving said pin members connected to end portions of the second abutting member said female members having a receptacle slot bounded by respective jaw members defining a mouth opening away from said second member, said slot including a pair of oppositely directed, coplanar curved channels extending from said mouth towards said second member, for receiving respective pins of said pair, the curvature of said channels being defined by a common radius, each channel including a closed bottom for receiving a respective pin member for pin member rotation thereagainst upon reltive rotation of said abutting members about said axis coincident with said pin, said jaw members being spaced apart less that the distance between outwardly oppositely facing surfaces of said pins and being spaced from respective bottoms associated with opposite channels a distance sufficient to permit said pin member normally resident within a channel to swing out of said channel and said mouth, free of said female member, upon relative rotation of said abutting members in a direction to swing said pin member away from the bottom of the channel in which it normally resides.

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**4,610,290**

**PULL-UP CURTAIN WITH PULL-UP DEVICE**

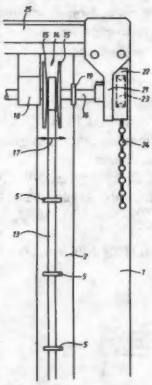
**Peter Dörflinger, Leutkircher Str. 31, Isny/Allgäu, Fed. Rep. of Germany (7972)**

**Filed Feb. 15, 1984, Ser. No. 580,227**

**Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3305300**

**Int. Cl.⁴ A47H** *5/032*

**U.S. Cl. 160—84 R** **3 Claims**



1. A self-adjusting pull-up curtain device comprising:

(a) a curtain rod connected to an upper horizontal part of a curtain;

(b) a pull-up device having a winding shaft disposed parallel to a longitudinal axis of said curtain rod, said pull-up device rotatably mounted in bearing blocks secured on said curtain rod, and said pull-up device being rotatably driven by a driving means;

(c) axially moveable winding spools mutually spaced and rotatably fixed on said winding shaft;

(d) a pulling element winding around each of said winding spools by leading pulling element through vertically spaced loops of a loop band fastened to the curtain in vertical alignment with said winding spools;

(e) a pull-up band attached to a lower end of said pulling element and fastened to a lower part curtain, said pull-up band being designed as a rectangular section to be wound on each of said winding spools;

(f) solid non-twisting band guidance elements connected to said loop band and through which said pull-up band is led;

(g) flanges of said winding spool laterally disposed, a distance slightly greater than a width of said pull-up band; and

(h) a collar being adjustably clamped to said winding shaft and being paired to one of said bearing blocks in which said winding shaft is rotatably mounted, said winding spools disposed on said winding shaft between said collar and said bearing block, whereby said collar limits the axial movement on one side of said winding spool and said bearing block limits axial movement on a second side of said winding spool.

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**4,610,291**

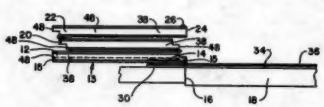
**INSULATING SHUTTER PANELS FOR BUILDING OPENINGS**

**Frank E. Carroll, 237 Maple Rd., Barrington, Ill. 60010**

**Continuation-in-part of Ser. No. 329,196, Dec. 10, 1981, Pat. No. 4,475,978. This application Jan. 15, 1985, Ser. No. 691,665**

**Int. Cl.⁴ E06B** *3/48, 3/26;* **F24J** *2/00*

**U.S. Cl. 160—117** **8 Claims**



1. Apparatus for covering a window or other opening in a building comprising:

a plurality of horizontal rail means secured to the interior of said building adjacent to and extending only outwardly from at least one generally vertical edge of said opening in a plane parallel to said opening;

at least one shutter panel slidably engaged with said rail means, said rail means extending horizontally a distance substantially less than the width of said slidably engaged shutter panel to provide concealment of said rail means when said slidably engaged shutter panel is in extreme slidable position in each direction and capable of substantially exposing and substantially covering said opening due to the sliding action of said slidable shutter panel relative to said vertical edge;

energy storage medium within the interior volume of said at least one shutter panel capable of collecting, storing and releasing solar energy.

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**4,610,292**

**INSULATING SHADE ASSEMBLY WITH REMOVABLE COVER**

**Scott Hausmann, West Brattleboro, and Allan McLane, Jr., Marlboro, both of Vt., assignors to Appropriate Technology Corporation, Brattleboro, Vt.**

**Continuation of Ser. No. 494,346, May 13, 1983, abandoned. This application May 15, 1985, Ser. No. 734,290**

**Int. Cl.⁴ E06B** *9/20*

**U.S. Cl. 160—120** **15 Claims**

6. An insulating window shade assembly comprising:

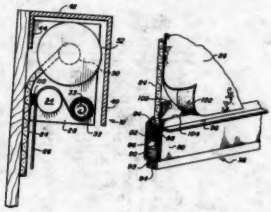
bracket means adapted to be mounted on the frame of a window,

a first roller carrying an insulating shade and being disposed within the bracket means on the inside of the window, said shade being adapted to be drawn from the roller to cover the inside of the window and to be wound upon the roller to expose the window,

a second roller carrying a removable cover fabric on the

inside of the shade and being supported by the bracket means, the second roller being spaced from and disposed independently of said first roller,

means disposed adjacent only the bottom edge of the insulating shade for connecting only the bottom edge of said cover fabric to the bottom only of the insulating shade so that the insulating shade and cover fabric may be drawn together over the inside of the window, said connecting means being readily openable so that the cover fabric may be removed from or adjusted with respect to the insulating shade, the cover fabric being otherwise free of any direct connection with said insulating shade,



guide means disposed adjacent the second roller and between the second roller and the insulating shade, said cover fabric passing over said guide means, for causing the cover fabric to hang closely adjacent the front of the insulating shade when the insulating shade is drawn over the window and when the insulating shade and cover fabric are connected together by said connecting means,

and means for continually tensioning the cover fabric when the insulating shade is drawn and when the cover fabric is connected thereto so that the cover fabric lies smoothly over the shade.

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**4,610,293**

## DEVICE FOR HEAT INSULATION AND AIR CONDITIONING

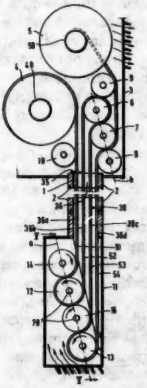
**Rolf-Diether Weiblen, Eltener Strasse 1, D-4330 Mülheim a.d. Ruhr, Fed. Rep. of Germany**

**Filed Apr. 30, 1984, Ser. No. 605,170**

**Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316263**

**Int. Cl.[4] E06B *9/08***

**U.S. Cl. 160—120** **18 Claims**



**1.** An insulating apparatus for use in a region between a structural assembly defining a region between two opposing, comprising;

a windable, flexible wall means having the longitudinal sides thereof provided with wall guiding profile members; said wall guiding profile members extending beyond the length of said flexible wall means at both ends thereof;

first and second means arranged at one end of the structural assembly simultaneously playing out and winding up said flexible wall means; the rotation of said first winding means being opposite the rotation of said second winding means;

means, stationarily arranged at the other end of the structural assembly, receiving said flexible wall means from said first winding means and deviating said flexible wall means into a reverse direction to be wound by said second winding means; and

at least one guide means for receiving said wall guiding profiles;

whereby at least one layer of said flexible wall means is contained in the region between two opposing surfaces of the structural assembly.

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**4,610,294**

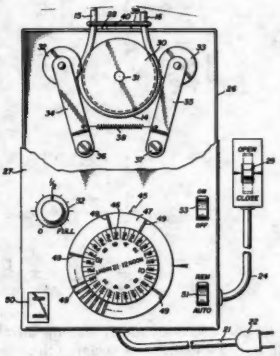
## DRAPERY ACTUATING MECHANISM HAVING DUAL TIMER

**Mario Anesi, 551 N. Bonny La., Inverness, Ill. 60067, and Fred M. Schwarzer, 5440 N. Ocean Dr. Apt. 1007, Singer Island, Fla. 33404**

**Filed Nov. 17, 1983, Ser. No. 552,765**

**Int. Cl.[4] A47H *5/02***

**U.S. Cl. 160—331** **10 Claims**




**1.** A mechanism for opening and closing at least one closure member, a cord being associated with the closure member and having a bight portion and a pair of reaches extending from the bight portion, said mechanism comprising a drive roller for driving engagement with the bight portion of the cord, electric motor means having first and second winding portions for respectively rotating said drive roller in opposite directions, first and second timed switching means for selectively supplying power to said electric motor means, said first timed switching means having first adjustment means for setting times at which power to said electric motor means is initiated, said second timed switching means having second adjustment means for setting an interval after which power to said electric motor means is terminated, each of said timed switching means including at least one pair of contacts and control means for selectively opening and closing the assocaited pair of contacts, and third switching means having first and second sets of contacts respectively disposed in opposite conditions and direction control means for controlling the conditions of said sets of contacts, the control means of said first timed switching means being coupled across a source of power and being oper-

ative to close its associated pair of contacts for selected durations in accordance with the setting of said first adjustment means, the contacts of said first timed switching means being coupled in series with the source of power and the control means of said second timed switching means, the contacts of said second timed switching means being coupled in series with the source of power and said direction control means, said first set of contacts being coupled in series with the source of power and said first winding portion, said second set of contacts being coupled in series with the source of power and said second winding portion, said direction control means being responsive to said second timed switching means for reversing the conditions of said first and second sets of contacts each time said second time switching means is actuated, whereby said motor means is caused to rotate in a direction opposite to its direction of rotation the previous time power was supplied to said electric motor means.

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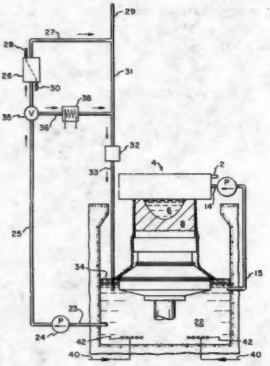
## 4,610,295
## DIRECT CHILL CASTING OF ALUMINUM-LITHIUM ALLOYS

**John E. Jacoby; Ho Yu, both of Murrysville, and Robert A. Ramser, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Nov. 10, 1983, Ser. No. 550,466**
**Int. Cl.[4] B22D *11/04, 11/07***
**U.S. Cl. 164—5** **13 Claims**



1. A process for continuously casting an aluminum alloy containing over about 1.5% by weight lithium into a solidified ingot having at least one minimum dimension of greater than about six inches, comprising:

initiating solidification of a liquid aluminum alloy containing over about 1.5% by weight lithium into an ingot in a continuous casting device;

direct chill cooling said ingot with a coolant comprising ethylene glycol having a moisture content less than about 10% by volume and in an amount predetermined to avoid explosions during said direct chill cooling, said coolant being applied to the surface of said ingot and separating therefrom;

collecting said coolant separating from said ingot in a collection pool having an upper unconfined surface;

maintaining a moisture barrier on said upper unconfined surface of said collected coolant to reduce moisture access to said pool;

recirculating said coolant from said collection pool for further direct chill cooling;

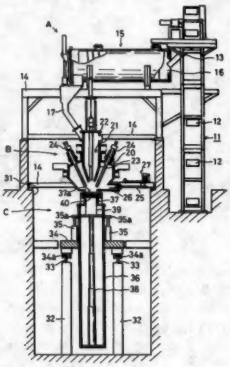
cooling said recirculating coolant; and

controlling said moisture content in said coolant at a predetermined level including treating said coolant to remove moisture therefrom.

## 4,610,296
## MELTING CAST INSTALLATION

**Susumu Hiratake, Kasugai; Yoichi Nakanishi, Nagoya; Sinobu Inuzuka, Inazawa; Kato Takeo, Nagoya; Hiroyuki Yamada, Kohnan, and Yasuo Watanabe, Chita, all of Japan, assignors to Daidotokushuko Kabushikikaisha, Japan**

**Filed Dec. 12, 1984, Ser. No. 680,869**
**Claims priority, application Japan, Dec. 13, 1983, 58-234807; Jun. 25, 1984, 59-130245**
**Int. Cl.[4] B22D *27/02***
**U.S. Cl. 164—469** **10 Claims**



1. A melting cast installation comprising: a melting apparatus for melting a metallic raw material into a molten pool of metal, a raw material feeding apparatus for feeding the raw material to said melting apparatus, and a casting apparatus for casting the molten pool of metal produced by said melting apparatus; said melting apparatus including a furnace wall formed with a lower opening for connection with a melting pot and with an upper annular rotatable portion thereof for revolution around the center axis of said lower opening, a guide cylinder having a vertical axis vertically positioned against said furnace wall, with the top end thereof passing through and disposed over said furnace wall and the lower end thereof positioned directly over said lower opening inside said furnace wall and a plurality of plasma arc torches radially arranged at regular intervals around the axis of said guide cylinder, pairs of said torches disposed opposite each other relative to said axis and individually directed toward said lower opening; a cylindrical limiter mounted vertically in said guide cylinder for vertical reciprocation against the lower opening of said guide cylinder; said casting apparatus including said melting post communicating and connecting with said lower opening of said melting apparatus, with the bottom surface thereof having vertical movement, and withdrawing means to gradually lower said melting pot; said raw material feeding apparatus including a raw material send forth port connected with the top end of said guide cylinder.

10. A raw material feeding method with use of a melting cast installation comprising: providing a melting apparatus for melting a charged raw material into a molten pool of metal, providing a raw material feeding apparatus provided over said melting apparatus, and providing a casting apparatus for casting said molten pool of metal, said melting apparatus including a plurality of plasma arc torches arranged radially over said molten pool of metal, and said raw material feeding apparatus including a guide cylinder extending downwards inside said furnace wall and provided with a contracted lower portion thereof, and a cylindrical limiter mounted vertically in said guide cylinder for vertical reciprocation against the lower opening of said guide cylinder; and characterized by guiding said charged raw material by said guide cylinder towards said molten pool of metal, providing an adjustable annular space for

passing said raw material between said limiter and the internal surface of said guide cylinder by displacing vertically said limiter, charging large size and small size raw materials into said raw material feeding apparatus, and dropping said small size raw material earlier and said large size raw material later toward said molten pool of metal by adjusting adequately the height of said limiter.

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4,610,297

## CONTROLLING SEAL SYSTEM IN ROTARY REGENERATIVE AIR PREHEATERS

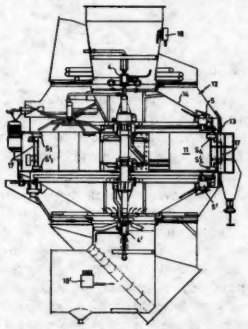
Stanley Gibson, Bangor, and Colin Tindall, Ballynahinch, both of Northern Ireland, assignors to Davidson & Company Limited, Belfast, Northern Ireland

Filed Aug. 30, 1984, Ser. No. 646,703

Claims priority, application United Kingdom, Sep. 23, 1983, 8325512

Int. Cl.[4] F28D *17/00, 19/00*

U.S. Cl. 165—9 3 Claims



1. A rotary regenerative air preheater having means for sealing between relatively rotatable parts of the preheater, and a plurality of drive means for driving the sealing means in a predetermined axial relationship, and control means comprising a plurality of electrical inductance sensors placed sequentially in the path of relative rotation of the sealing means, and a control circuit, each sensor being linked through the circuit to at least one associated said drive means, the circuit including means for comparing the sensed axial relationship at each sensor with a predetermined axial relationship and driving the associated drive means to bring the sealing means to the predetermined axial relationship, whereby the sealing means is sequentially checked and adjusted as necessary on a plurality of occasions during each relative rotation, and at least some of said sensors having adjacent them a compensating sensor having a preset gap, the compensating sensor and said sensor being in a bridge circuit in the control circuit, whereby to at least reduce effects of the environment in which the said sensors work.

4,610,298

## PROCESS AND INSTALLATION FOR APPLYING A CONTROLLABLE HEAT-EXCHANGE IN REGENERATIVE HEAT-EXCHANGER

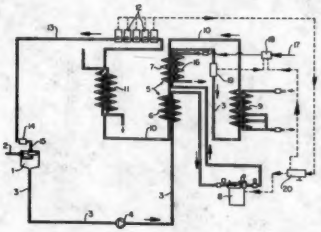
Hans W. van Schagen, Bussum; Johannes W. Tewes, and Rodolphe H. Goede, both Amsterdam, all of Netherlands, assignors to Stork Amsterdam B.V., Amsterdam, Netherlands

Continuation-in-part of Ser. No. 518,796, Jun. 23, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 753,261

Claims priority, application Netherlands, Dec. 8, 1981, 8105524; PCT Int'l Appl., Dec. 8, 1982, 82/00262

Int. Cl.[4] A23C *3/02;* B60H *1/00*

U.S. Cl. 165—39 3 Claims



1. In a heat-treatment plant for heat treatment of a product liquid of continuous flow, a high temperature heater and a regenerative heat-exchanger connected thereto, the regenerative heat exchanger having counterflow heat exchange between product liquid entering and leaving the high temperature heater, said regenerative heat exchanger including a cooling liquid passage with a heat exchanging surface for withdrawing heat from the product liquid going to the high temperature heater, a cooling liquid conduit interconnected to the cooling liquid passage, said cooling liquid conduit including a flow control which is reactive to temperature and flow rate of the product liquid, the control having a temperature sensor interconnected to the product liquid conduit leading to the high temperature heater and a flow rate sensor interconnected to the product liquid conduit.

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4,610,299

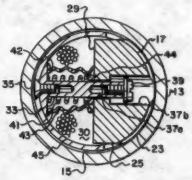
## SPRING-BIASED HEAT SINK

C. G. Hoover, Fort Worth, Tex., assignor to S.I.E., Inc., Fort Worth, Tex.

Filed Apr. 1, 1985, Ser. No. 718,512

Int. Cl.[4] H01L *23/34*

U.S. Cl. 165—80.2 9 Claims



1. In an instrument of the type having a tubular housing and a frame containing electrical components telescopingly carried in the housing, means for transferring heat from selected components to the housing, comprising in combination:

a heat sink of rigid heat conductive metal, having an outer surface of which a portion is arcuate and of substantially the same radius of curvature as the housing;

mounting means for mounting at least one of the components on the heat sink; and

spring means located between the heat sink and frame for urging the heat sink outer surface into contact with the housing.

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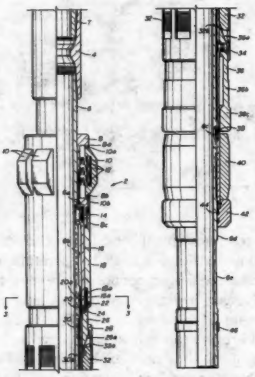
4,610,300

## TUBING ACTUATED RETRIEVABLE PACKER

Albert A. Mullins, II, Humble; Patrick C. Stone, Houston, and Gary D. Ingram, Sugarland, all of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Sep. 14, 1984, Ser. No. 651,278
Int. Cl.[4] E21B *33/129*
U.S. Cl. 166—134 50 Claims



1. In a packer apparatus for use in establishing sealing integrity between upper and lower zones in an annular area between an inner and outer conduit in a subterranean well, comprising:

an inner mandrel attachable to the inner conduit;

anchoring slip means engagable with the outer conduit for holding the packer in engagement with the outer conduit against oppositely directed forces;

packing element means engagable with the outer conduit for sealing against fluid pressure acting thereon in the upper and lower zones;

shearable means for retaining the anchoring slip means and packing element means in engagement with the outer conduit, the shearable means being sheared by application of a force to the inner mandrel for releasing the anchoring slip means and the packing element means from engagement with the outer conduit; the improvement comprising;

means for supporting forces acting on the packer due to the pressure of fluid in the upper zone without subjecting the shearable means to forces due to the pressure of fluid in the upper zone.

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4,610,301

## INFILL DRILLING PATTERN

Farhad Ghassemi, Lafayette, La., and John D. Alexander, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

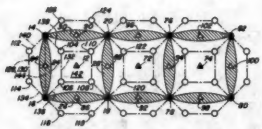
Filed Sep. 30, 1985, Ser. No. 781,574
Int. Cl.[4] E21B *43/24, 43/30*
U.S. Cl. 166—245 32 Claims

1. A method of modifying an original fluid distribution pattern for injecting driving fluid into a subsurface formation, said original pattern including a plurality of contiguous original pattern units each including an original central injection well and four original corner production wells substantially defining the corners of an imaginary square, contiguous ones of said original pattern units sharing two common ones of said original corner production wells, said method comprising the steps of:

(a) providing a plurality of new injection wells each being located in an approximately aligned position between adjacent ones of said original corner production wells;

(b) providing a plurality of new production wells each being located in an approximately aligned position between one of said original central injection wells and an associated one of said original corner production wells, said new injection wells and new production wells being so arranged that each of said new injection wells is surrounded by two adjacent ones of said original corner production wells and four of said new production wells thus defining a new seven-spot pattern unit; and

(c) injecting said driving fluid into said new injection wells to sweep relatively high oil saturation areas of said formation that remain after initial flooding of said formation by said original fluid distribution pattern.



27. A method of modifying an original five-spot distribution pattern including an original central injection well and four original corner production wells, all of said wells intersecting a common subsurface formation, said method comprising the steps of:

(a) providing a new injection well in an approximately aligned position between adjacent ones of said original corner production wells;

(b) injecting driving fluid into said new injection well;

(c) producing formation fluids from said adjacent ones of said original corner production wells; and

(d) wherein said driving fluid sweeps from said new injection well toward said adjacent ones of said original corner production wells thereby sweeping formation fluid from areas of said formation which were relatively unaffected by said original five-spot distribution pattern.

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4,610,302

## OIL RECOVERY PROCESSES

J. Bennett Clark, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 3, 1985, Ser. No. 751,694
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—246 14 Claims

1. A method for recovering oil from a subterranean formation contining oil and having at least one injection and at least one production well comprising:

(a) injecting through at least one injection well into the formation of established production at least one sacrificial agent in an amount sufficient to adsorb on and occupy active sites of the formation matrix and thereby diminish microbial cell adsorption on said formation matrix,

(b) subsequently injecting into the formation via at least one

injection well microbial cells which produce metabolic products in situ effective for enhancing oil displacement from the formation, and

(c) producing oil in an enhanced recovery from at least one production well.

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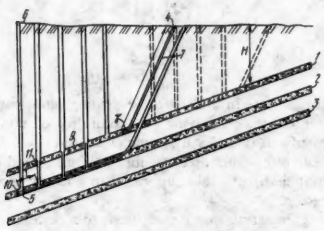
4,610,303

## METHOD OF UNDERGROUND GASIFICATION OF A SERIES OF GENTLY DIPPING AND INCLINED COAL SEAMS

Vadim N. Kazak; Valery K. Kapralov, both of Moscow, and Alfei F. Volk, deceased, late of Zaporozhie, all of U.S.S.R. (by Igor F. Volk, administrator), assignors to Vsesojuznoe Nauchno-Proizvod Stvennoe Obiedinenie "Sojuzpromgaz", U.S.S.R.

Filed Nov. 16, 1984, Ser. No. 671,941
Int. Cl.[4] E21B *43/24, 43/243;* E21C *43/00*
U.S. Cl. 166—251 5 Claims



1. A method of underground gasification of a series of gently dipping and inclined coal seams comprising the steps of:

determining the depth of occurrence and the thickness of each coal seam in a series;

determining a safe mining depth for each coal seam in said series;

opening said coal seams by drilling operating injection and production wells;

interconnecting said drilled operating wells within the seam to be gasified;

setting the coal afire and establishing gasification passages within said coal seam;

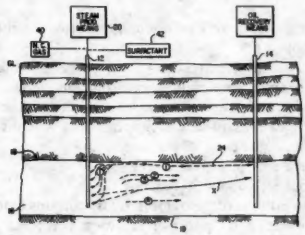
gasifying each subsequent seam on completion of gasification of the preceding seam by supplying a gaseous medium into the first wells and removing the produced gas from the second wells, said gasification being effected upwards from the underlying seam to the overlying seams with a rock thickness therebetween exceeding a safe mining depth for the underlying seams or downwards from the overlying seam to the underlying seams with a rock thickness therebetween being smaller than the safe mining depth of the underlying seams, the gasification of the subsequent seam being effected after the rock overlying the gasified seam is no longer shifted, the shift thereof being associated with said gasification, a firing boundary of the underlying seam being shifted towards a coal pillar by an amount equal to or greater than a first spacing of rock caving in the roof of the gasified seam.

4,610,304

## HEAVY OIL RECOVERY BY HIGH VELOCITY NON-CONDENSIBLE GAS INJECTION

Todd M. Doscher, The Doschers Group, 740A E. Main St., Ventura, Calif. 93001

Continuation-in-part of Ser. No. 452,200, Dec. 22, 1983, Pat. No. 4,516,636. This application Nov. 27, 1984, Ser. No. 675,133
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] E21B *43/24, 43/243*
U.S. Cl. 166—261 22 Claims




1. A method of enhanced recovery of oil from oil zone disposed below an impermeable zone, said method comprising the steps of:

injecting a non-condensible gas under pressure via an injection well into said oil zone at a rate at least 100,000 standard cubic feet per day (SCFD) per acre of oil zone projection to cause the gas to drive through a flow channel delineated between the impermeable zone and the underlying oil with sufficient velocity to mobilize a layer of oil at the top of said oil zone thereby creating an emulsion of oil in reservoir waters which is driven through the reservoir to the producing well for removal of said oil, said gas being injected at a rate no greater than 2,000,000 standard cubic feet per day (SCFD) per acre of oil zone projection.

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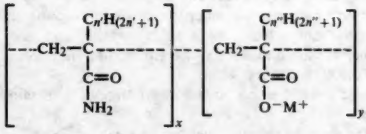
4,610,305

## OILFIELD FLOODING POLYMER

Fred D. Martin; Melvin J. Hatch; Joel S. Shepitka, all of Socorro, N. Mex., and Lorraine G. Donaruma, Syosset, N.Y., assignors to The New Mexico Institute of Mining and Technology, Socorro, N. Mex.

Continuation-in-part of Ser. No. 500,215, Jun. 2, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,375
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—275 9 Claims

1. In the process of recovering hydrocarbons from a subterranean formation by polymer flooding comprising injecting into said formation a viscous aqueous solution of polymer, the improvement comprising including in said solution an amount of water-soluble polymer effective to increase the viscosity thereof, said water-soluble polymer represented by the general structure:



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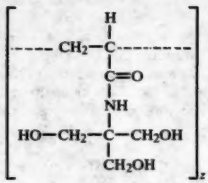


wherein:

n′ and n″ are integers individually selected from the set of 0 to about 4;

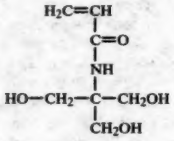
$M^+$ is a cation selected from the group consisting of hydrogen, sodium, ammonium, potassium, and mixtures thereof; and x, y, and z represent the mole percent of the subtended monomer present in said polymer and wherein:

x is about 1 to about 99 percent;

y is 0 to about 80 percent; and

z is about 1 to about 50 percent.

**9**. In the process of recovering hydrocarbons from a subterranean formation by polymer flooding comprising injecting into said formation a viscous aqueous solution of polymer, the improvement comprising including in said solution an amount of water-soluble polymer effective to increase the viscosity thereof, said water-soluble polymer containing at least about one percent groups derived from monomers represented by the general structure:



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**4,610,306**

**NON-RETARDING FLUID LOSS ADDITIVES FOR WELL CEMENTING COMPOSITIONS**

**Dyke W. Reese, Bakersfield, Calif.; Ray S. Pace, Arlington, Tex., and Lee F. McKenzie, Merriman, Utah, assignors to Hughes Tool Company, Houston, Tex.**

**Filed Dec. 19, 1984, Ser. No. 683,788**

**Int. Cl.[4] E21B** *33/138*

**U.S. Cl. 166—293** **3 Claims**

**1**. A method of cementing a well bore, comprising the steps of:

mixing together a hydraulic cement, water in an amount to produce a pumpable slurry, and a fluid loss additive which comprises a copolymer of a first monomer of dimethyldiallyl ammonium chloride and a second anionic monomer having a functionality selected from the group consisting of carboxlyate and sulfonate, the monomer ratio of said nonionic water soluble monomer to said anionic monomer being in the range from about 85:15 to 95:5, and said copolymer having a molecular weight in the range from about 200,000 to 400,000;

pumping said cement slurry to the desired location in said well bore; and

allowing said cement slurry to harden to a solid mass.

**4,610,307**

**METHOD AND APPARATUS FOR SELECTIVELY STRAIGHT OR DIRECTIONAL DRILLING IN SUBSURFACE ROCK FORMATION**

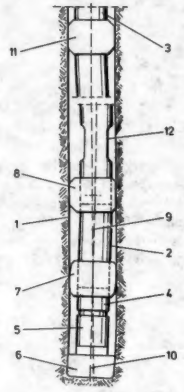
**Rainer Jürgens, Celle-Osterloh, and Volker Krüger, Celle, both of Fed. Rep. of Germany, assignors to Norton Company, Worcester, Mass.**

**Continuation of Ser. No. 693,343, Jan. 22, 1985, abandoned. This application Dec. 18, 1985, Ser. No. 810,895**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403239**

**Int. Cl.[4] E21B** *17/10, 17/20*

**U.S. Cl. 175—320** **6 Claims**




**1**. A device for use in underground drilling comprising:

a tubular housing, comprised of a plurality of connected sections of substantially the same diameter,

a down-hole motor mounted within the housing and having an output shaft rotatably supported in a lower section of the housing,

means for connecting said output shaft to a drill bit,

means for connecting an upper end of said housing to a drill string,

first and second stabilisers mounted adjacent to and spaced from each other on said housing,

said first stabiliser being mounted on a lower section of the housing and nearer than the second stabiliser to the output shaft connecting means, and

at least one stress relieving means provided on said housing above the first stabiliser and below the means for connecting the upper end of said housing to the drill string;

each of said stress relieving means comprising a relatively flexible section of said housing adapted to bend and permit during drilling an angular relationship and connection between adjacent sections of the housing, and

said first stabiliser being concentric with the housing and said second stabiliser being eccentric with the housing.

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**4,610,308**

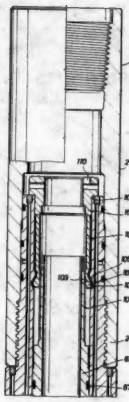
**BOTTOM HOLE SAMPLER AND SAFETY VALVE AND VALVE THEREFOR**

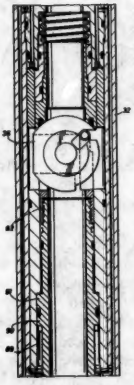
**Dale E. Meek, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.**

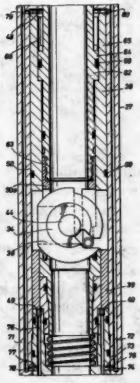
**Filed Dec. 27, 1984, Ser. No. 686,576**

**Int. Cl.[4] F21B** *34/10, 49/08*

**U.S. Cl. 166—321** **17 Claims**







5. A ball valve for use in downhole tools such as bottom hole samplers and safety valves comprising a tubular housing, a ball having an opening therethrough, a valve seat engaging the ball, means mounting the ball for rotation around an axis transverse the longitudinal axis of the housing, a valve operator connected to the ball to rotate the ball to an open position with its opening parallel to the longitudinal axis of the housing when the operator is moved in one direction and to rotate the ball to a closed position with the opening extending transverse the longitudinal axis of the housing when the operator is moved in the opposite direction, piston means connected to the valve operator responsive to fluid pressure to move the valve operator in one direction, and reset means operable through the open end of the housing for moving the valve operator to return the valve to the open position.

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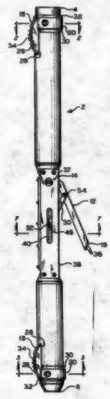
**4,610,309**

## DOWNHOLE TOOL

**John T. O'Brien; Donald D. Goff, and Gary M. Hoover, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Nov. 30, 1984, Ser. No. 677,001**
**Int. Cl.[4] E21B *23/00***
**U.S. Cl. 166—382** **18 Claims**



1. A collar suitable for use on an elongated well tool, said collar having a longitudinal axis, a generally cylindrical interior surface for receiving the elongated well tool, and a generally cylindrical external surface and pair of lugs extending generally radially outward from the generally cylindrical exterior surface of the collar, said lugs being separated by an acute angle with respect to the longitudinal axis of the collar for engagement with a well bore wall when an arm on the opposite side of the elongated well tool from the pair of lugs is actuated.

13. In the positioning of an elongated tool in a well bore hole by moving an arm radially outward from the body of the tool so that the end of the arm contacts the wall of the bore hole, the improvement comprising supporting the tool on at least one pair of lugs protruding from the side of the tool opposite to the arm so that there is point contact of at least 4 points between the tool and the wall of the bore hole.

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**4,610,310**

## FIRE PROTECTION SYSTEM

**Dennis R. Miller, 6125 Haverford Ave., Indianapolis, Ind. 46220, and Eugene R. Barnett, 6268 Windsor Dr., Indianapolis, Ind. 46219**

**Filed Sep. 30, 1982, Ser. No. 429,241**
**Int. Cl.[4] A62C *37/10***
**U.S. Cl. 169—37** **15 Claims**

1. A mult-nozzled dispenser head for a fire protection system to cover an area larger than would be covered by water dispensed from a single nozzle dispenser head, comprising:

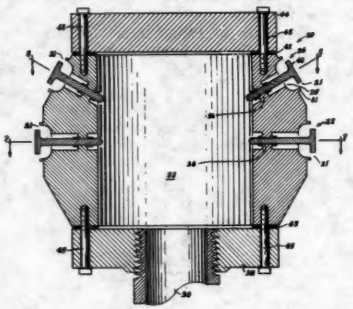
the multi-nozzled dispenser head being provided to have a pluraltity of sets of outlets, and each of the nozzles being provided with adjustable means to change the water droplet size,

each of the sets being provided to have a plurality of outlets,

the sets of outlets being of a nature such as to dispense water in concentric zones, a lower one of the sets of outlets being generally horizontally directed, and an upper one of the sets of outlets being upwardly directed,

the lower set of outlets being arranged and directed so as to dispense water in a pattern substantially 360° in circumferential extent, and

the upper set of outlets being arranged and directed and of a quantity such as to restrict dispensing circumferentially so that



the zone covered by the water dispensed from the respective upper set of outlets is a selected amount less than 360° so as to exclude dispensing into areas of a zone to which water is being dispensed from another of such heads,

the adjustability of droplet size, in combination with the optional less than 360° extent of water dispensing from any nozzle-head, combining to achieve safety protection against different fire-hazard situations by different droplet sizes in various zones of coverage, from the same multi-nozzled dispenser head.

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**4,610,311**

## METHOD FOR REDUCING THE AERIAL DRIFT OF AQUEOUS PREPARATIONS

**James A. Bronner, Glendale; John D. Moore, Los Angeles, and Paul R. Dale, La Crescenta, all of Calif., assignors to Sanitek Products, Inc., Los Angeles, Calif.**

**Division of Ser. No. 466,592, Feb. 15, 1983, Pat. No. 4,510,081, which is a continuation-in-part of Ser. No. 298,249, Aug. 31, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,478**

**Int. Cl.**[4] **A62C** *2/00, 3/02;* **C09K** *3/22, 21/00*

**U.S. Cl. 169—45** **6 Claims**

4. A method for reducing the drift of an aqueous fire retardant preparation applied to vegetation or soil by aerial spraying or discharge, said preparation manufactured by admixture with a drift control concentrate and characterized by the admixture's ability to remain effective when made with hard or brackish water, by the admixture's ability not to clog spray nozzles, and by the concentrate's relative ease of solution into aqueous preparations, said method comprising the steps of admixing with said preparation, a concentrate consisting essentially on a weight basis, of

about 10% to about 70% of a polymer mixture having about one to 9 parts of a water soluble polymer or mixture of said polymers which will increase the viscosity and thicken the aqueous preparation, and about 9 parts to about one part of a water soluble polymer or mixture of said polymers which will impart viscoelasticity to said aqueous preparation, wherein said viscoelasticity increasing polymer is selected from the group consisting of:

(a) polyacrylamides or their copolymers or derivatives,

(b) Polymers and copolymers of acrylic acid and methacrylic acid or their salts,

(c) polymethacrylamides of their copolymers or derivatives,

(d) polyacrylonitriles, their hydrolysis products, copolymers, or derivatives; and

(e) polymers or ethylene or alkylene oxide,

about 0.5 to about 50% of a surfactant, and

oil in an amount to make the sum of the percentages of the ingredients comprising said concentrate, total 100%.

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**4,610,312**

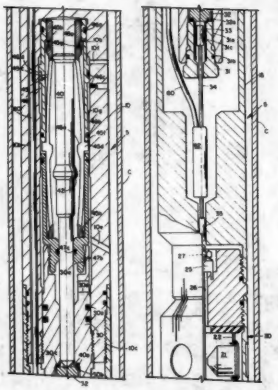
## REDUNDANT FIRING MECHANISM FOR A WELL PERFORATING GUN

**John A. Nelson, Spring, and Gregg W. Stout, Montgomery, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.**

**Filed Jun. 10, 1985, Ser. No. 743,044**

**Int. Cl.**[4] **E21B** *43/11*

**U.S. Cl. 175—4.52** **11 Claims**



1. A perforating gun for perforating the casing and adjacent production formation of a subterranean well, comprising: a hollow housing containing a plurality of vertically spaced impact detonatable primers; a gun structure depending from said hollow housing and mounting a plurality of vertically spaced shaped charges; a primer cord in communication with each of said shaped charges; means for transmitting the detonating energy of each of said primers to said primer cord; said hollow housing defining a fluid pressure chamber; means for supplying fluid pressure to said fluid pressure chamber for detonating the lower one of said primers; and firing means independent of said fluid pressure actuated means actuable by a free fall detonating means for impacting the upper one of said primers; whereby said upper primer may be detonated in the event said lower primer fails to detonate.

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**4,610,313**

## DRILL BIT HAVING A FAILURE INDICATOR

**Jeffery E. Daly, and Paul E. Pastusek, both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.**

**Continuation of Ser. No. 580,502, Feb. 15, 1984, Pat. No. 4,548,280. This application May 31, 1985, Ser. No. 739,884**

**Int. Cl.**[4] **E21B** *10/22*

**U.S. Cl. 175—40** **8 Claims**

1. A lubrication system to indicate a decrease in lubricant volume below a predetermined level in a rotary drill bit having a bit body adapted to receive drilling fluid at a high first pressure from a suspended drill string, and adapted to discharge the drilling fluid therefrom in a void space between the bit body and an associated well bore with the drilling fluid in said space

being at a low second pressure; said lubrication system comprising:

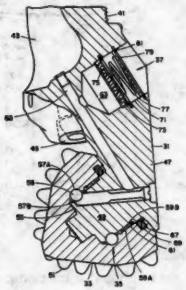
a variable volume reservoir for holding a supply of lubricant;

passaging extending from the reservoir to supply lubricant to bearing means carried by said bit body;

annular seal means adjacent said bearing means to block the flow of lubricant from the drill bit;

means forming a surface portion of said variable volume reservoir and movable toward and away from said reservoir to vary the volume thereof;

biasing means continuously urging said surface portion toward said reservoir to pressurize the lubricant in said



reservoir to an intermediate third pressure of a value between said first and second pressures of said drilling fluid; and

sensing means operatively responsive to a decrease in the volume of the lubricant in the lubrication system below a predetermined level, said sensing means being operable upon a decrease of lubricant volume below the predetermined level to cause a signal to be generated at the associated drilling rig whereby upon loss of lubricant from said reservoir past said seal means resulting from said intermediate third pressure and the resultant decrease in the lubricant volume below the predetermined level, a signal indicating lubricant loss will be provided at the drill rig.

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**4,610,314**

## TRUCK MOUNTED DRILLING MACHINE

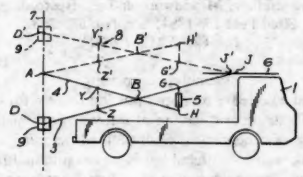
**Bernard L. Glen, P.O. Box 471, Edenvale, 1610, South Africa**

**Filed Jan. 18, 1985, Ser. No. 692,938**

**Claims priority, application South Africa, Sep. 7, 1984, 84/7043**

**Int. Cl.[4] E21B *7/02*; E21C *11/02***

**U.S. Cl. 175—57** **5 Claims**



1. A vehicle mounted drilling machine, comprising:

an assemblage of rigid bar links mounted on said vehicle and supporting a rotary motor of said drilling machine, said linkages including;

a first rigid bar link pivotally supported on said vehicle at one end of said first bar link;

a second rigid bar link pivotally connected intermediate its ends to the other end of said first bar link;

means supporting said rotary motor from one end of said second bar link;

means guiding the other end of said second bar link for linear movement in a horizontal plane including the pivotal axis of said one end of said first link; and,

means for varying the included angle between said first and second bar links;

whereby, upon movement of said links relative to each other, said rotary motor is moved along an axially straight verticle line.

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**4,610,315**

## PIPE HANDLING APPARATUS FOR OIL DRILLING OPERATIONS

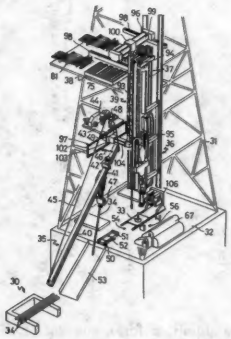
**Minoru Koga; Toshio Kizawa, and Toshio Hirose, all of Tokyo, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 18, 1985, Ser. No. 712,642**

**Claims priority, application Japan, Apr. 27, 1984, 59-83969**

**Int. Cl.[4] E21B *19/20***

**U.S. Cl. 175—85** **2 Claims**



1. A pipe handling apparatus for oil drilling operations and the like, comprising a short pipe transfer unit (**35**) having a guide rail (**40**) extending from a pipe storage space (**30**), in which short pipes (**34**) comprising drill pipes and drill collars are stored, to a position above an oil well center (**33**), and a carriage (**41**) on said guide rail (**40**) so as to transfer said short pipes (**34**), said carriage (**41**) having a chucking unit (**47**) adapted to chuck said short pipe (**34**); a pipe lift unit (**36**) having a suspension member (**64**) suspended from a suspension cable (**68**) via a displacement-absorbing member (**107**) above said oil well center (**33**) so that said suspension member (**64**) can be moved vertically and horizontally, said pipe lift unit (**36**) being adapted to lift and lower the short pipe (**34**) from and into said oil well center (**33**); a stand pipe rack unit (**38**) having a plurality of storage grooves (**74**) for holding therein, in a standing state stand pipes (**37**) each of which has been withdrawn from said oil well center (**33**) and comprises a plurality of series-connected short pipes (**34**), and storage chambers (**78**) formed at entrance portions (**77**) of said storage grooves (**74**) and adapted to hold therein stand pipes (**37'**) each of which comprises drill collars; a stand pipe transfer unit (**39**) having a post (**93**) between said stand pipe rack unit (**38**) and said oil well center (**33**), said post (**93**) having an upper end connected to an upper manipulator (**96**) through turning means and a universal joint (**101**) and a lower end connected to a lower manipulator (**97**) through a vertically slidable spherical joint (**105**) whereby the post (**93**) is swingable in front and rear and right and left, said post (**93**) further having at its upper and lower ends a pair of upper and lower hands (**94**) and (**95**)

secured thereto and adapted to respectively clamp upper and lower ends of the stand pipe (37), whereby the hands (94) and (95) are turnable in unison with the post (93); a swing arm (51) on a floor surface (32), on which said oil well center (33) is disposed, adapted to fall for prevention of the short pipe from being swung during transportation thereof along the guide rail (40); and a short pipe connecting rotary unit (106) which is displaceable.

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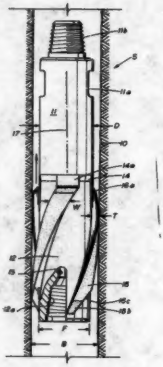
**4,610,316**

**FREE FLOW STABILIZER**

James Boaz, Tucson, Ariz., assignor to LOR, Inc., Houston, Tex.

Filed Nov. 23, 1984, Ser. No. 674,259
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—323 18 Claims



1. A bladed stabilizer for mounting in a drill string of a generally cylindrical configuration and a generally uniform outer diameter above a drill bit to ream and stabilize a bore hole, comprising:

an upper body section having a generally cylindrical configuration, having an outer diameter which is diametrically spaced inwardly from the bore hole to form an upper annular flow area, and is substantially the same size as the outer diameter of the drill string;

a lower body section formed with said upper body section and having generally cylindrical configuration, said lower body section having an outer diameter which is less than the outer diameter of said upper body section;

said upper and lower body sections cooperating to provide a continuous internal body bore for the circulation of a drilling fluid such as air downwardly through said stabilizer;

a plurality of spirally directed blades mounted on said lower body section in an equally circumferentially spaced relationship with respect to each other, the outer diameter of said mounted blades forming the reaming diameter of said stabilizer for reaming the bore hole to said reaming diameter;

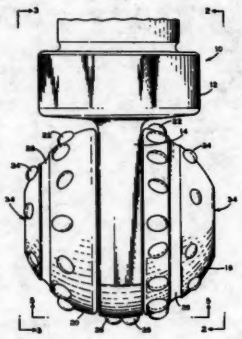
said blades and said lower body section cooperating to provide a net annular blade flow area with respect to said bore hole, which net annular blade flow area is greater than said upper annular flow area past said upper body section whereby the flow rate of drilling fluid and cuttings circulating past said blades is at least equal to the flow rate of such cuttings passing said upper body.

**4,610,317**

**SPHERICAL BIT**

John R. England, Sudbury, and Donald A. Desjardins, Garson, both of Canada, assignors to Inco Limited, Toronto, Canada

Filed Mar. 4, 1985, Ser. No. 707,703
Claims priority, application Canada, Mar. 19, 1984, 449916
Int. Cl.[4] E21B *10/08*
U.S. Cl. 175—331 6 Claims



1. A spherical rotary bit, the bit comprising a shank and a tongue extending therefrom, a first axis of symmetry, a shaft disposed normally to the tongue, the shaft including a second axis of symmetry, a pair of semi-spheres rotatably affixed to the shaft and rotatable about the second axis of symmetry, each semi-sphere disposed on opposing sides of the tongue and substantially parallel with the tongue and one another, bearing means disposed between the shaft and the semi-spheres, means for supplying lubricant to the bearing means, fluid passageways extending through the tongue, an arcuate groove extending along the external surface of each semi-sphere and substantially parallel with the tongue, each groove not identically positioned on the semi-spheres, one semi-sphere including a first row of staggered cutters disposed on one side of its groove and second row of smaller staggered cutters on the other side of the groove, the remaining semi-sphere including a substantially straight third row of cutters disposed on one side of its groove and a fourth row of smaller staggered cutters on the other side of the groove, all of the cutters not identically situated in a corresponding location on the semi-spheres.

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**4,610,318**

**ROTARY CUTTER ASSEMBLY**

Robert D. Goodfellow, Meadowbrook Ter., Bedford, Pa. 15522

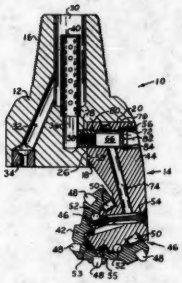
Filed Feb. 15, 1984, Ser. No. 580,368
Int. Cl.[4] E21B *10/20*
U.S. Cl. 175—339 16 Claims

1. A rotary cutter assembly, comprising:

a drill head adapted at an upper portion thereof for coupling to a drill string and having at a lower portion thereof a plurality of receptacles, each defined between a pair of opposing walls, said head having a longitudinal fluid passageway communicating with a first transverse passageway opening into each said receptacle;

at least one bit assembly comprising a shank releaseably received in one said receptacle, a cutter means, and a bearing means intermediate said shank and cutter means, said shank having a second transverse passageway communicating with a bearing passageway leading to said bearing means;

first locking means to secure said shank between said pair of opposing walls; and



second locking means connecting said transverse passageways to secure said bit assembly to said head.

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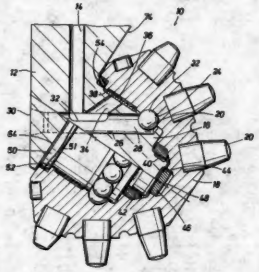
**4,610,319**

## HYDRODYNAMIC LUBRICANT SEAL FOR DRILL BITS

**Manmohan S. Kalsi, 14307 Chevy Chase, Houston, Tex. 77079**

**Filed Oct. 15, 1984, Ser. No. 660,695**
**Int. Cl.[4] E21B** *10/22;* **F16J** *15/34;* **F16C** *33/74*
**U.S. Cl. 175—371** **29 Claims**



1. In a rotary cone type drill bit having a cone support structure incorporating a body structure forming a liquid lubricant supply and a plurality of bit support legs, each leg having an axle supporting a roller cone cutter element in rotatable relation thereon, the improvement comprising:

(a) a seal chamber being defined cooperatively by said roller cone cutter element and said cone support structure and being formed in part by a circular relatively rotatably movable sealing surface;

(b) a resilient circular hydrodynamic sealing element disposed about said axle and within said seal chamber and maintaining a seal between said roller cone cutter element and said cone support structure and forming a sealed partition establishing a drilling fluid interface and a lubricant interface, said circular sealing element establishing a sealing interface with said circular rotatably movable sealing surface;

(c) said lubricant interface being of a configuration acting cooperatively with said liquid lubricant to hydrodynamically induce lubricant wedging causing controlled unidirectional hydrodynamic pumping of lubricant from said lubricant interface through said sealing interface to said drilling fluid interface responsive to rotation of said roller cone cutter element about said axle for lubrication at said sealing interface and for lubricant flushing of solid particulate from said sealing interface; and

(d) said drilling fluid interface being of a configuration acting cooperatively with said driling fluid to induce substantially no hydrodynamic back feeding drilling fluid pumping activity at said sealing interface responsive to rotation of said roller cone cutter element about said axle.

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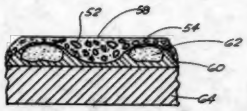
**4,610,320**

## STABILIZER BLADE

**Billy Beakley, Lake Charles, La., assignor to Directional Enterprises, Inc., Youngsville, La.**

**Filed Sep. 19, 1984, Ser. No. 651,925**
**Int. Cl.[4] E21B** *10/00*
**U.S. Cl. 175—409** **22 Claims**



1. Method for applying hard tungsten carbide particles to the surface of a metal substrate, comprising:

applying a soft, elastic metal powder to the surface of said substrate;

coating large tungsten carbide particles having a maximum dimension at least within the range of more than ¼ of an inch and less than 1 inch with said soft elastic metal powder;

placing said coated large tungsten carbide particles on the surface of the substrate coated with the soft, elastic metal powder;

dispersing additional soft elastic metal powder over the tungsten carbide particles, and fusing said powder to form a homogeneous, large tungsten carbide particle containing mixture bonded to the substrate; and

applying and fusing a hard matrix over said large tungsten carbide particles containing mixture, the hard matrix containing smaller tungsten carbide particles having a maximum dimension at least within the range of more than 1/32 of an inch and less than ¼ of an inch.

15. A stabilizer blade for use in drilling comprising:

a substrate;

a soft matrix fused to said substrate, said soft matrix substantially encapsulating large particles of tungsten carbide, said large particles having a maximum dimension at least within the range of more than ¼ inch to one inch;

a hard matrix fused in substantially covering relationship to said soft matrix, said hard matrix having a plurality of small tungsten carbide particles dispersed therein, said small particles having a maximum dimension at least within the range of 1/32 inch and less than ¼ inch.

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**4,610,321**

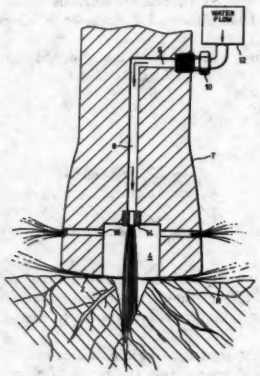
## CAVITATING JET DEVICE

**Michael H. Whaling, 1966 Millwood Cr., Sudbury, Ontario, Canada P3E 2T2**

**Filed Mar. 25, 1985, Ser. No. 715,619**
**Int. Cl.[4] E21B** *7/18*
**U.S. Cl. 175—422 R** **5 Claims**

1. A liquid jet device for direct application to a working surface to be treated, comprising a body defining walls of a cavitation chamber, the chamber having an open end facing the working surface and the body being shaped to contact the working surface in a continuous annular zone surrounding the open side of the cavitation chamber, a source of high pressure liquid, a jet nozzle connected to said source and supported in said body on a side of the cavitation chamber opposite said open end and directed towards said open end so that a jet of high pressure liquid ejected from said nozzle will impact the working surface in a zone within and spaced from said annular zone, at least one vent opening in the walls of the cavitation

chamber and spaced from said open end, the flow capacity of said at least one vent opening being large compared with leakage between the annular zone and the working surface, large enough to exhaust the liquid from said cavitation chamber without engendering a pressure rise in the chamber sufficient to suppress cavitation therein, and small enough to ensure



retention of sufficient liquid in the chamber to submerge the liquid jet, the working pressure of the source of high pressure liquid, the dimensions of the jet nozzle and the distance between the nozzle and the open end of the cavitation chamber being such that shear between the liquid jet and the liquid retained in the chamber will induce cavitation vortices and sustain them until impact with the working surface.

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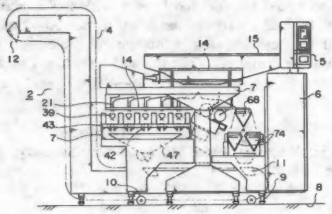
**4,610,322**

## WEIGHT MEASURING APPARATUS FOR ELONGATED ARTICLES

**Yukio Sugioka, Shiga, and Yoshiharu Mikami, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan**

**Filed Oct. 24, 1984, Ser. No. 664,438**
**Claims priority, application Japan, Oct. 28, 1983, 58-200849**
**Int. Cl.[4] G01G** *19/22, 19/00, 13/02*
**U.S. Cl. 177—25** **4 Claims**



1. In an apparatus for measuring long objects having a plurality of weight detectors provided transversely under a long feeding hopper the improvement comprising providing a transverse conveying trough with its base end facing the feeding hopper, the trough has a plurality of openings disposed stepwise, each opening is connected to a downward chute, each downward chute is connected to a pool hopper provided on a lower side measuring hopper supported on the weight detector, a bulk chute is disposed opposite the conveying trough, the base end of the bulk chute facing the feeding hopper, the trough connected to a bulk pool hopper connected to a measuring hopper supported on the weight detector, with a set capacity adjusting shutter provided on the back chute comprising a rear shutter moving vertically at a fixed position and a movable front shutter, a cover closing device for each pool hopper, and the measuring hopper connected to a control unit.

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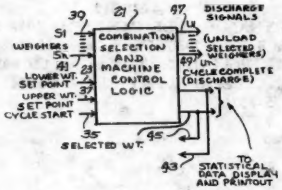
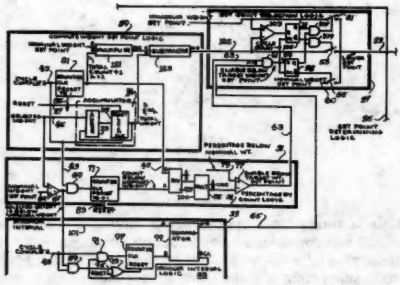
**4,610,323**

## COMBINATION WEIGHING SYSTEM

**David A. Chenoweth, San Pablo, and Thornton R. Davis, Jr., Albany, both of Calif., assignors to The Paxall Group, Inc., Chicago, Ill.**

**Filed Jul. 24, 1985, Ser. No. 759,060**
**Int. Cl.[4] G01G** *19/22, 23/14*
**U.S. Cl. 177—25** **6 Claims**



1. In a combination weighing system which comprises a plurality of hoppers each having a discharge gate and an associated check weigher, a chute communicating with said hoppers, and a combination selection and machine control logic for receiving weight signals from the check weighers and for sending discharge signals to selected discharge gates, the combination selection and machine control logic being adapted to receive upper weight and lower weight input signals and also adapted to provide a cycle complete output signal, the improvement which comprises providing a maximum weight signal and a minimum weight signal, and a changeable input signal between the maximum and minimum weights, said changeable input signal being determined by a set-point determining circuit which receives said maximum weight signal or said minimum weight signal and a nominal weight signal, and which includes computing means for providing said changeable input signal to the combination selection and machine control logic between said maximum or minimum weight signal and said nominal weight signal.

4,610,324

## COURIER CLIPBOARD AND SCALE CASE

Joseph Mexicotte, 1224 Electric Ave., Apt. 120, Lincoln Park, Mich. 48146

Filed Jul. 5, 1985, Ser. No. 752,035
Int. Cl.[4] G01G *19/00, 21/28*
U.S. Cl. 177—245 5 Claims

1. A courier clipboard and scale case comprising a hollow elongated box having bottom, side, front and rear walls;

a scale having a base nested and mounted within said box upon said bottom wall, including a yieldable top plate;

a cover at one end hinged to said rear wall normally overlying and enclosing said scale;

and a spring biased yieldable clip assembly mounted upon said cover adjacent one end and defining with said cover a clipboard.

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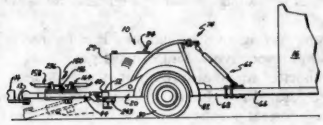
4,610,325

## FUNCTION REVERSE APPARATUS FOR POWERED TRAILER

Rogers H. Anderson, 10501 Bloomington Freeway, Bloomington, Minn. 55420

Filed Jul. 26, 1985, Ser. No. 759,333
Int. Cl.[4] B60D *1/14*
U.S. Cl. 180—14.2 14 Claims



1. In a powered trailer of the type having a main frame supported by wheels with brakes, an engine thereon to drive said wheels, a tongue assembly for connecting the powered trailer to a lead vehicle with the tongue assembly including a first member adapted to be connected to the vehicle and a second member connected to the powered trailer, the first member having a control pin fixedly mounted thereon and being movable in a first direction and in a second opposite direction relative to the second member and the position and motion of the first member relative to the second member being dependent on the position and motion of the lead vehicle relative to the powered traler, and with first and second hydraulic actuators for detecting the position and motion of the first member relative to the second member, the first hydraulic actuator having a piston rod and a cylinder portion, the cylinder portion of the first actuator being mounted with respect to the second member of the tongue assembly in a first sensing position with its piston rod extending in a direction to engage the control pin on the first member so that movement of the first member in the first direction relative to the second member causes retraction of the piston rod into the cylinder portion of the first actuator, and the first actuator being operably connected to the engine of the powered trailer for increasing the speed of the engine when the first member moves in the first direction relative to the second member and decreasing the speed of the engine when the first member moves in the second direction relative to the second member, and the second hydraulic actuator having a piston rod and a cylinder portion, the cylinder portion of the second actuator being mounted with respect to the second member of the tongue assembly in a first sensing position with its piston rod extending in a direction to engage the control pin on the first member so that movement of the first member in the second direction relative to the second member causes retraction of the piston rod into the cylinder portion of the second actuator, and the second actuator being operably connected to the brakes of the powered trailer for braking the powered trailer when the first member moves in the second direction relative to the second member, the improvement which comprises:

means for reversing the motion detection relationships of the first and second hydraulic actuators with respect to the first member so that when the first actuator detects motion of the first member in the second direction the engine speed is increased, when the first actuator detects motion of the first member in the first direction the engine speed is decreased and when the second actuator detects motion of the first member in the first direction the brakes are applied, the reversing means including means for pivotally mounting the first and second hydraulic actuators with respect to the second member for simultaneously:

(a) placing the first hydraulic actuator in a second sensing position with its piston rod extending in direction to engage the control pin on the first member so that movement of the first member in the second direction relative to the second member causes retraction of the piston rod into the cylinder portion of the first actuator, and

(b) placing the second hydraulic actuator in a second sensing position with its piston rod extending in direction to engage the control pin on the first member so that movement of the first member in the first direction relative to the second member causes retraction of the piston rod into the cylinder portion of the second actuator.

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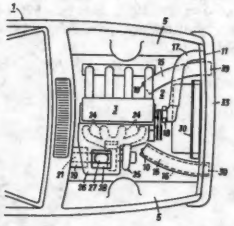
4,610,326

## AIR COOLING ARRANGEMENT FOR ENCAPSULATED VEHICLE ENGINE

Karl Kirchweger; Franz Knopf, and Gerhard Thien, all of Graz, Austria, assignors to AVL Gesellschaft fiir Verbrennungskraftmaschinen und Messtechnik mbH, Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Apr. 6, 1984, Ser. No. 597,425
Claims priority, application Austria, Apr. 8, 1983, 1267/83; Jun. 28, 1983, 2370/83; Aug. 25, 1983, 3040/83
Int. Cl.[4] B60K *11/08*
U.S. Cl. 180—68.1 11 Claims



1. A motor vehicle, comprising a frame and body components, an engine compartment, a water-cooled internal combustion engine mounted in said engine compartment to power the vehicle, encapsulating elements sealed against parts of said frame and said body components to form a completely enclosed sound-insulating capsule for said engine compartment, said capsule including sound-absorbing inlet and outlet openings for ventilation of said capsule, means for blower ventilating said capsule, said blower ventilating means comprising a blower and a first cooling air inlet passage connected thereto,

said first cooling air inlet passage terminating in one of said inlet openings, another of said inlet openings being provided with a second cooling air inlet passage separate from said blower ventilating means and having an associated intake opening, said intake opening being located in one of said body components so as to be exposed to external dynamic pressure developing during movement of the vehicle.

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**4,610,327**

**DOUBLE-JOINT TRANSMISSION DEVICE IN PARTICULAR FOR A VEHICLE**

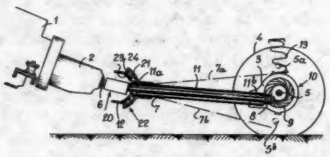
**Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France**

**Filed Jul. 31, 1984, Ser. No. 636,249**

**Claims priority, application France, Aug. 2, 1983, 83 12726**

**Int. Cl.⁴ B60K *20/00***

**U.S. Cl. 180—73.1** **11 Claims**



1. A transmission device comprising a driving element, a driven element, a double transmission joint having two articulations and a common intermediate element interconnecting the articulations, said joint being disposed between the driving element and the driven element, one of the driving and driven elements being capable of undergoing relative to the other element an angular movement modifying the total operating angle of the joint, a fixed member, and a resiliently yieldable articulation which has an articulation centre substantially centered on the centre of the double joint and has a high tangential flexibility and a high axial rigidity connecting said element capable of undergoing angular movement relative to the other element to said fixed member.

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**4,610,328**

**FOUR-WHEEL STEERING SYSTEM FOR VEHICLE**

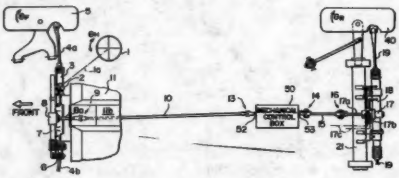
**Hirotaka Kanazawa; Teruhiko Takatani; Shigeki Furutani, all of Hiroshima; Isamu Chikuma, Gumma; Satoru Shimada, Gumma, and Hiroshi Eda, Gumma, all of Japan, assignors to Mazda Motor Corp., Hiroshima and Nippon Seiko Kabushiki Kaisha, Tokyo, both of, Japan**

**Filed Jan. 29, 1985, Ser. No. 696,144**

**Claims priority, application Japan, Feb. 1, 1984, 59-12869[U]; Feb. 8, 1984, 59-17177[U]**

**Int. Cl.⁴ B62D *5/10***

**U.S. Cl. 180—140** **6 Claims**



1. In a four-wheel steering system for a vehicle in which steering force of a front wheel steering system is transmitted to a rear wheel steering system by way of a mechanical transmission means so that the rear wheels are turned in response to turning of the front wheels,

the improvement which comprises a steering-force-take-out means composed of a second rack member operatively connected with a first rack member of a rack and pinion front wheel steering system which is moved right and left in response to operation of a steering wheel so that the second rack member is moved together with the first rack member, a pinion in mesh with the second rack member and an output shaft fixed to said pinion, the output shaft being connected to the rear wheel steering system by way of a transmission shaft, and said first rack member being separate from the mounted parallel to the second rack member.

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**4,610,329**

**MUFFLER FOR EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE**

**Hideharu Tanaka; Mutsuo Sekiya, and Fusaoki Uchikawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

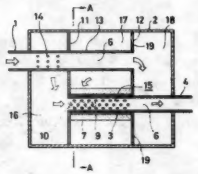
**Filed Apr. 16, 1985, Ser. No. 723,990**

**Claims priority, application Japan, Sep. 20, 1984, 59-198242**

**The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.**

**Int. Cl.⁴ F01N *1/10***

**U.S. Cl. 181—265** **12 Claims**



1. A muffler for exhaust gas of an internal combustion engine comprising,

(a) a casing having an inlet and an outlet for receiving and expelling, respectively, said exhaust gas,

(b) a cylindrical sound-absorbing body comprising,

(i) a perforated pipe having openings formed therein,

(ii) a cylindrical porous sound-absorbing material concentrically surrounding said perforated pipe,

(iii) and a thin film sandwiched between said perforated pipe and said sound-absorbing material,

(c) means for balancing the gas pressure between the space which is surrounded by said perforated pipe, said thin film and said sound-absorbing material, and the space surrounding said sound-absorbing material,

(d) said cylindrical sound-absorbing body being positioned within said casing to cause said exhaust gas flowing from said inlet to said outlet to pass through said perforated pipe, and

(e) a plurality of gas expansion chambers in said casing positioned to cause exhaust gas passing from said inlet to said outlet to enter at least one of said plurality of gas expansion chambers.

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**4,610,330**

**DRIVE-IN MANHOLE STEP CONSTRUCTION**

**Ronald W. Borst, Kansas City, Mo., assignor to Clay and Bailey Manufacturing Co., Inc., Kansas City, Mo.**

**Filed Jul. 25, 1984, Ser. No. 634,373**

**Int. Cl.⁴ E04F *19/00***

**U.S. Cl. 182—90** **9 Claims**

9. In a manhole step construction comprising a U-shape, strong metal reinforcing bar having molded thereover a configured step and supporting leg U shape fully enclosing said bar to make a composite, yet integral, plastic coated, steel core reinforced manhole step body,

said body having an elongate, basically straight step portion at the base thereof with two substantially like and symmet-

rical leg support members extending substantially parallel to one another and at substantial right angles from the ends of said step portion,

the free outer ends of said leg support members being adapted to being driven or hammered into paired, spaced apart, inwardly tapered, formed holes in a wall and having three separate, adjacent zones formed on the free ends thereof, said zones including:

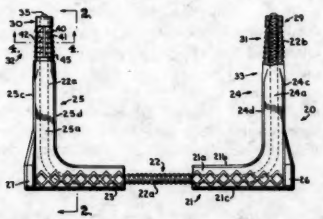
(a) an outermost frusto-conical end piece having an inner base,

(b) an intermediate, recessed, outwardly tapered leg portion having deflectable wall engaging members thereon and

(c) an innermost, outwardly tapering shoulder portion,

the improvement which comprises the deflectable wall engaging members comprising a plurality of rows of wedge teeth segments provided on said intermediate portion between said outermost frusto-conical end piece and said innermost outwardly tapering shoulder portion, individual wedge teeth segments axially separated from one another in each row thereof at four positions, first, on substantial center lines of the tops and bottoms of said intermediate leg portions, in positions substantially 180° opposed to one another and, secondly, in two positions substantially 90° laterally displaced from said first mentioned separations, at substantial center lines of the opposed sides of said intermediate portions,

said wedge teeth segments each angling upwardly and radially outwardly from outermost, least diameter base portions to innermost, greater diameter portions in said rows,



the rows of wedge teeth segments increasing in diameter along the lengths thereof passing from the outermost row of wedge teeth segments to the innermost row of such,

a base, outermost portion of each wedge tooth commencing at the innermost greater diameter portion of the tooth outboard thereto or the inner base of the frusto conical end piece,

the top and bottom axial wedge teeth separations each including an elongate, straight groove separating adjacent ends of wedge teeth segments from one another,

said axial wedge teeth segment separations positioned at the top and bottom of the legs additionally including beveled, alternately oppositely extending relieved zones on successively outwardly positioned wedge teeth segment ends on each side of said groove, each beveled zone adjacent to and opposite a radial wall on the adjacent wedge segment in a given row thereof across said groove,

the wedge tooth segment separation at the sides of the intermediate portions of the outer ends of said manhole step comprising alternate, oppositely extending, beveled reliefs of the said wedge teeth segment ends approaching the side center line, each beveled zone directly next to a radial wall on the adjacent wedge segment in a given row thereof,

at least two pressure relief grooves running the length of each of said outermost frusto-conical end pieces, said grooves positioned substantially 180° opposed to one another on the top and bottom sides of each said end piece and extending in a direction substantially axial of each respective leg support member, the end piece grooves being in substantial axial alignment with the two wedge tooth segment axial separations and the groove therebetween on the top and bottom sides of each said end piece,

at least four pressure relief grooves provided on each of said innermost shoulder portions running the substantial length thereof in a direction extending substantially axial of each respective leg support member, said shoulder portion pressure relief grooves positioned substantially 90° displaced from one another and substantially on center lines of the tops, bottoms and sides of said innermost shoulder portion,

the relief grooves on the two sides of said shoulder portions being provided by beveling the sides of each said shoulder portion to a second and axial wall on the substantial center line of the shoulder portion sides,

there being a stop centrally on the bottom of each of the leg support members having a leading stop portion next to the innermost shoulder portion, one of the grooves on each shoulder portion running to the stop, there being provided a pressure relief channel on the leading stop portion joined by said groove.

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**4,610,331**

## WHEEL HUB WITH BUILT-IN BRAKE

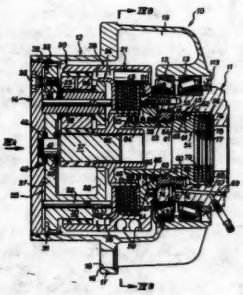
**Léonce Rogier, Saint Denis, and Jacques Lavaquerie, Herblay, both of France, assignors to SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile, Saint Etienne, France**

**Filed Nov. 2, 1983, Ser. No. 548,009**

**Claims priority, application France, Nov. 3, 1982, 82 18402**

**Int. Cl.[4] B60B** *27/00;* **F16D** *55/40*

**U.S. Cl. 188—18 A** **18 Claims**

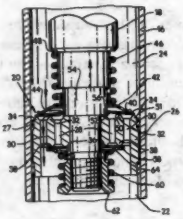


1. A wheel hub with built-in disk brake and hydraulic control unit, said wheel hub comprising a fixed support sleeve extending axially from one end of said wheel hub, a generally tubular hollow body, bearing means rotatably mounting said hollow body on said support sleeve, means on the outside of said hollow body for attaching a wheel rim flange, a removable cover for closing an access end of said hollow body axially remote from said one end, means for removably fixing said cover at said access end independently of said means for attaching a wheel rim flange, said disk brake comprising at least one brake disk, means mounting said brake disk within said hollow body and generally axially between said fixed support sleeve and said access end, said one brake disk being constrained to rotate with a wheel shaft rotatable inside said fixed support sleeve, a hydraulic control unit for applying an axially clamping force to said one brake disk, said hydraulic control unit being entirely accommodated within said fixed sleeve, said one brake disk being accessible through said access end of said hollow body independently of said hydraulic control unit, and said hydraulic control unit also being accessible through said access end.

## 4,610,332
## VELOCITY SENSITIVE VALVE ELEMENT FOR A SHOCK ABSORBER

Jack W. Mourray, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 318,646, Nov. 5, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 764,966
Int. Cl.[4] F16F 9/34
U.S. Cl. 188—322.15 2 Claims



1.

A piston for an automotive shock absorber comprising:

a piston having a first passageway axially extending therethrough and circumscribed by a first valve seat;

flow control means for controllably opening said first passageway when said piston and flow control means have a pressure exerted thereon in a first direction;

a second passageway axially extending therethrough radially outboard of said first passageway and bypassing said flow control means;

a second valve seat circumscribing said second passageway; and

an asymmetrically responsive pressure sensitive frustroconical valve biased at its outer diameter against said second valve seat by a coil spring and spring seat and constructed to:

(i) close said second passageway in response to a pressure above a first predetermined level exerted on said valve in said first direction by resiliently flexing into contact with said first valve seat;

(ii) remain open to a first extent to flow occurring through said second passageway when a pressure below said first predetermined level is exerted on said valve in said first direction; and

(iii) axially shift in its entirety in a second direction against the force of said coil spring so that said outer diameter becomes unseated from said second valve seat so as to open to flow occurring through said second passageway to an extent greater than said first extent when pressure above a second predetermined level is exerted on said frustroconical valve.

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## 4,610,333
## FRAME FOR FLEXIBLE SUITCASE AND FLEXIBLE SUITCASE MAKING USE OF A FRAME OF THIS TYPE

André G. Seynhaeve, Senlis, France, assignor to Ste Delsey, Bobigny, France

Continuation of Ser. No. 588,369, Mar. 12, 1984. This application Sep. 12, 1985, Ser. No. 775,324
Claims priority, application France, Mar. 25, 1983, 83 04898
Int. Cl.[4] A45C 5/00
U.S. Cl. 190—18 A 6 Claims

1. A one-piece injection moulded plastic suitcase frame of generally rectangular shape comprising

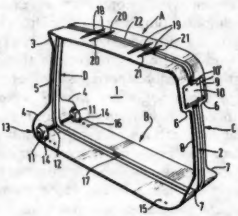
(a) a relatively wide and substantially flat base portion,

(b) two radiused lower corner portions at the ends of the base portion, said corner portions being of substantially the same width as the width of the base portion at the junctures with the base portion, one of said corner portions having said same width over a major portion of the length of the corner portion and having bushings provided on opposite sides thereof, said bushings being integrally formed with the frame and having a transverse rib extending therebetween, said bushings and rib providing means to rigidify the corner for the purpose of supporting the weight of the suitcase,

(c) two relatively narrow opposite said flat portions connected to said corner portions respectively,

(d) a relatively wide top portion having a width less than the base portion but wider than the side portions,

(e) two radiused upper corner portions connected to the upper ends of the side portions respectively and to the ends of the top portion respectively, said corner portions



being substantially the same width as the width of the top portion at the junctures with the top portion, at least one of said upper corner portions having a width substantially equal to the width of the top portion over a major portion of the length of the upper corner portion, and

(f) a substantially continuous groove being provided on the outsides of the base portion, lower corner portions, side portions, top portion and upper corner portions, said groove being defined by a relatively narrow central strip offset inwardly of each of said top, base, side, upper and lower corner portions thus defining a rib on the inside surfaces of said portions complementary to said groove.

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## 4,610,334
## LUGGAGE FRAME WITH FLEXIBLE REINFORCEMENT SPRING

Joseph Y. Pelavin, 8200-4 Kennedy Blvd. East, North Bergen, N.J. 07047

Filed Apr. 11, 1985, Ser. No. 721,961
Int. Cl.[4] A45C 13/04, 13/36; F16F 1/00
U.S. Cl. 190—122 11 Claims

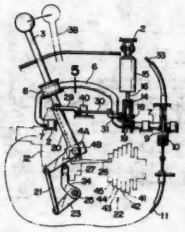
1. A luggage construction comprising a pair of spaced sidewalls, a peripheral wall joining said pair of spaced sidewalls at their respective edges and defining the top, bottom and ends of said luggage construction, portions of said peripheral wall being flexible, wire means extending laterally in a direction essentially parallel to the edges of said spaced sidewalls at least along a flexible portion of said peripheral wall, a flat spring having a repeating U-shaped pattern extending along said wire means in said lateral direction, and coupling means for slidably coupling said flat spring to said wire means, said flat spring assisting in the restoration of said peripheral wall to its original shape after being deformed.

4,610,335

## CONTROL DEVICE FOR CLUTCH AND TRANSMISSION IN VEHICLES

Takeshi Miyazawa; Hiroshi Sueshige; Yutaka Niikawa, all of Saitama, and Masahide Shimokawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,302
Claims priority, application Japan, Nov. 10, 1982, 57-196944; Feb. 28, 1983, 58-32566
Int. Cl.[4] B60K *41/22*
U.S. Cl. 192—3.62 9 Claims



1. A control device for a clutch and a transmission in a vehicle, comprising;

(a) a clutch including a release lever and a clutch spring, and disconnectable by said release lever;

(b) a transmission including a plurality of gears for changing the speed of said vehicle and a shifter for selecting one of said gears at a time for operation;

(c) a substantially single control lever angularly moveable about at least one shaft for actuating said clutch and said transmission;

(d) a first link mechanism for transmitting angular movement of said control lever to said release lever of said clutch;

(e) a second link mechanism for transmitting angular movement of said control lever to said shifter of said transmission;

(f) a damper for imposing a dampening force during engagement of said clutch. said damper is a hydraulic damper connected to said second link mechanism.

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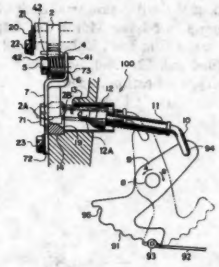
4,610,336

## AUTOMATIC TRANSMISSION LOCKING MECHANISM FOR PARKING

Yoshinari Kuwayama; Masakatsu Miura, both of Anjo, and Kunio Morisawa, Toyota, all of Japan, assignors to Aisin-Warner K.K., Anjo and Toyota Jidosha K.K., Toyota, both of, Japan

Filed May 27, 1983, Ser. No. 498,912
Claims priority, application Japan, May 28, 1982, 57-091725
Int. Cl.[4] B60K *41/26*
U.S. Cl. 192—4 A 2 Claims

1. Parking brake structure for an automatic transmission mechanism comprising a parking gear rotatably mounted on a driven shaft, a pivot shaft having a circumferential groove at the surface and disposed in a hole provided with a stationary member to position in parallel with the driven shaft of said parking gear, a pawl element having one end with a hole disposed in a slot provided with the stationary member and pivotally mounted on said pivot shaft by the pivot shaft disposed in a hole of the pawl element between a locked position in which said parking gear is locked and a released position in which said parking gear is released, a torsion coil spring means positioned within an oscillating plane in which the pawl element pivots to urge the pawl element toward the released position, a clamp member having one end rigidly secured to the stationary member and the other end provided with a bight portion into which said pivot shaft interfit through its groove, a rod member movably mounted in the reciprocating direction perpendicular to the oscillating plane of said pawl element and a cam member secured to the end of said rod member to each



pivot said pawl element toward the locked position and released position in combination with the reciprocating movement of said rod member.

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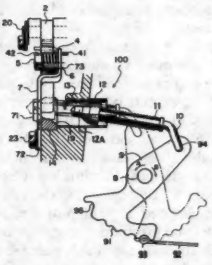
4,610,337

## PARKING BRAKE STRUCTURE FOR AUTOMATIC TRANSMISSION MECHANISM

Yoshinari Kuwayama; Masakatsu Miura, both of Anjo, and Kunio Morisawa, Toyota, all of Japan, assignors to Aisin-Warner K.K., Anjo and Toyota Jidosha K.K., Toyota, both of, Japan

Filed May 27, 1983, Ser. No. 498,870
Claims priority, application Japan, May 28, 1982, 57-091723
Int. Cl.[4] B60K *41/26*
U.S. Cl. 192—4 A 3 Claims

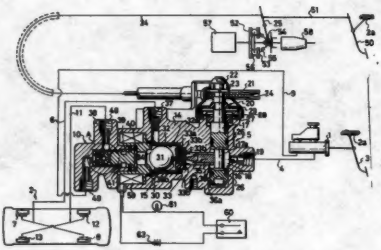


1. An automatic transmission locking mechanism comprising a manual shift lever having a locking position, a detent level interlocked with and adapted to be turned by the manual shift lever, a rod adapted to be advanced or retracted by the detent lever, a cam mounted on the rod, a bracket on which the cam runs, a pawl having a detent and a free end portion and adapted to be pushed by the cam to an operating position from a released position thereof when the manual shift lever is placed to the locking position, a pawl shaft on which the pawl turns, a parking gear engaged with the detent when the pawl is in the operating position, a projecting part in the vicinity of the free end disposed on a stationary member and a torsion coil spring mounted around the projecting part within a plane in which the pawl turns and secured at one end to the stationary member and engaged with the pawl at the other end to bias the pawl from the operating position to the released position.

## 4,610,338
## BRAKE DEVICE FOR CONTROLLING BRAKE OPERATION ON INCLINES

Hitoshi Kubota, Minamiashigara; Tadaaki Otokuni, Tokyo; Shoji Suzuki, and Keiji Nakagawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nippon Air Brake Co., Ltd., Kobe, both of, Japan

Filed Jul. 12, 1984, Ser. No. 630,276
Claims priority, application Japan, Jul. 14, 1983, 58-128342
Int. Cl.[4] B60K *41/24*
U.S. Cl. 192—13 A 10 Claims



9. A brake device which supplies and maintains pressure fluid from a pressure source to a brake actuating device attached to a wheel of a vehicle, comprising:

a brake pedal;

a pressure source for supplying a pressure fluid responsive to said brake pedal;

a brake retainer valve, which includes:

a valve body,

a valve chamber formed in said valve body and comprising a valve element and a valve seat for engagably seating said valve element,

a cam chamber formed in said valve body substantially perpendicular to said valve chamber and operatively engaging said valve chamber, said cam chamber comprising a cam axis and a rotatable cam having a reduced diameter and being eccentrically set relative to said cam axis, and

a plunger which extends between said valve chamber and said cam chamber substantially perpendicular to said cam axis, one end of said plunger contacting said valve element and the other end of said plunger contacting said cam, wherein said cam axis is drivenly connected to a clutch device to rotate said cam thereby moving said plunger until said valve element seats on said valve seat in the uncoupled state of the clutch device;

circuit means for detecting that the vehicle is in reverse gear;

a solenoid, housed in said brake retainer valve and connected to said circuit detecting means, said solenoid magnetically attracting said valve element in a direction opposite said valve seat when the circuit means detects that the vehicle is in reverse gear;

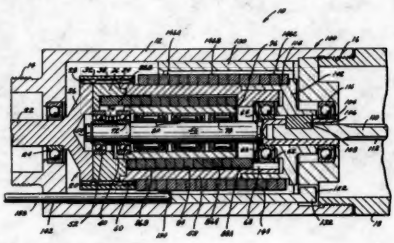
a valve device operatively connected to said pressure source and said brake retainer valve, said valve device comprising a main body adjacent and extending parallel to said valve body, a piston housed in said main body, a seal member attached to an end of said piston opposite said valve body, and a joining orifice opening into said main body at an end of the main body opposite said valve body, wherein when said valve element is seated on said valve seat, said pressure fluid positions said piston in said main body to engage said seal member and said joining orifice; and

four brake actuating devices, each of said devices being connected to a respective wheel of the vehicle, wherein two of said brake actuating devices are operatively connected to said pressure source through said brake retainer valve and the other two of said brake actuating devices are operatively connected to said pressure source through said valve device.

## 4,610,339
## ADJUSTABLE TORQUE LIMITING ASSEMBLY

Donald A. Ciolli, University Heights, Ohio, assignor to American Assembly Tools, Inc., Cleveland, Ohio

Continuation of Ser. No. 568,773, Jan. 6, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 790,789
Int. Cl.[4] F16D *43/21, 13/08*
U.S. Cl. 192—48.92 20 Claims

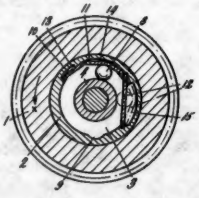


1. An adjustable torque limiting assembly comprising, in combination, a first wrap spring having a pair of ends, an input member having means for receiving said pair of ends of said wrap spring, means associated with said input member for adjusting the relative angular position of one of said pair of ends relative to the other of said pair of ends, an output member disposed within said first wrap spring, said output member having a cylindrical portion engaged by at least portion of said first wrap spring, a second wrap spring disposed about portions of said input member and said output member and a member having a cylindrical opening disposed about said second wrap spring.

## 4,610,340
## OVERLOAD SAFETY ON CLUTCHES

Ludger Helmes, Velbert, and Rolf-Jürgen Krämer, Wuppertal, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 547,315
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242046; Oct. 1, 1983, 3335729
Int. Cl.[4] F16D *7/02*
U.S. Cl. 192—56 R 6 Claims



1. An overload clutch apparatus of the type including a drive element and a driven element arranged concentrically with respect to each other defing an annular space therebetween, and a driver body provided in said space for coupling said drive element and said driven element by engaging one of said elements and a leaf spring on the other of said elements, said leaf spring extending in the annular space forming a reduced cross-section region of said annular space, said driver body comprising a rolling body, said rolling body further by bending out a section of the leaf spring which crosses the

annular space effecting an uncoupling between said elements, the improvement wherein

said rolling body is freely disposed in said annular space, and, respectively, drivably engageable with said leaf spring,

a plurality of said leaf springs arranged adjacent each other to form secants to the annular space,

said rolling body is a ball,

each of said leaf springs are immediately adjacent each other and successive of the leaf springs have successively increasing lengths.

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## 4,610,341
## FLUID FRICTION CLUTCH

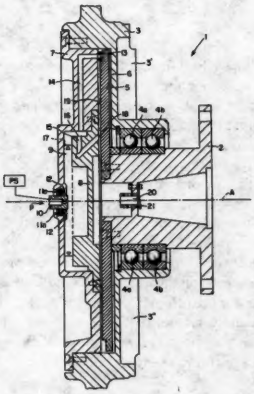
**Kurt Hauser, Stuttgart, and Werner Hümmel, Affalterbach, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany**

**Filed Jul. 3, 1984, Ser. No. 627,558**

**Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324924**

**Int. Cl.⁴ F16D *35/00***

**U.S. Cl. 192—58 B** **21 Claims**



1. A fluid friction clutch comprising:

housing means defining a working chamber means, and a reservoir chamber means,

primary and secondary parts mounted for relative rotation with respect to each other and exhibiting working surfaces disposed in said working chamber means,

fluid connection means for accommodating flow of viscous fluid means from the reservoir chamber means to the working chamber means to control the fluid drive connection between the working surfaces of the primary and secondary parts,

and fluid return means for returning said fluid means from the working chamber means to said reservoir chamber means,

wherein said reservoir chamber means is a pressure chamber, wherein the fluid connection means opens into the reservoir chamber means at a radial distance from the clutch rotational axis which is larger than the radial distance from the clutch axis to a fluid ring formed in the reservoir means during rotation thereof,

and wherein said fluid return means is located radially outwardly of the fluid connection means,

and wherein said fluid connection means is configured to prevent flow of viscous fluid means from the reservoir chamber means to the working chamber means when the reservoir chamber means is not pressurized.



## 4,610,342
## CLUTCH FOR MOTOR VEHICLES

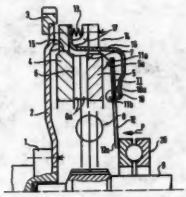
**Erich Scheer, Prosselsheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany**

**Filed Aug. 6, 1984, Ser. No. 637,897**

**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329039**

**Int. Cl.⁴ F16D *13/71***

**U.S. Cl. 192—70.28** **8 Claims**



1. A clutch unit such as for motor vehicles, comprising

a driving disc (2) having an axis;

a first friction face (7) stationary with respect to said driving disc (2) and substattially perpendicular with respect to said axis;

a pressure plate (4) mounted for common rotation with said driving disc (2) and for axial movement with respect thereto and having a second friction face (6) substantially perpendicular to said axis and facing said first friction face (7);

a clutch disc (8) frictionally engageable with said first and said second friction faces (7, 6);

a diaphragm spring (11) urging said pressure plate (4) with said second friction face (6) towards said first friction face (7) such as to maintain frictional engagement between said clutch disc (8) and said first and said second friction faces (7, 6), said diaphragm spring (11) having radially inwardly directed tongues (12);

a clutch release unit (20) axially engageable with said radially inwardly directed tongues (12) in view of disengaging said clutch disc (8) from frictional engagement with said first and second friction faces (7, 6);

said first friction face (7) being provided on an anti-pressure plate (5) axially spaced from said driving disc (2);

said pressure plate (4) being located axially between said driving disc (2) and said anti-pressure plate (5);

a spring force transmitting structure (16, 10) being fastened to said pressure plate (4) and having at least one substantially axially directed portion (16) extending across said anti-pressure plate (5) adjacent the radially outer periphery thereof and a cover portion (10) extending substantially radially inwardly from said axially extending portion (16) on the side of said anti-pressure plate (5) which is remote from said first friction face (7);

said diaphragm spring (11) being located axially between said anti-pressure plate (5) and said cover portion (10) and having a radially outer zone (11*a*) axially engaging said anti-pressure plate (5) and a radially intermediate zone (11*b*) axially engaging said cover portion (10);

said clutch release unit (20) acting on said radially inwardly directed tongues (12) of daid diaphrgm spring (11) on the side thereof remote from said driving disc (2), movement of said clutch release unit (20) towards said driving disc (2) effecting disengagement of said clutch disc (8) from said frictional engagement with said first and second friction faces (7, 6); and

clutch release spring means (13) being provided for lifting said pressure plate (4) away from said anti-pressure plate (5) towards said driving disc (2) in response to axial movement of said clutch release unit (20) towards said driving disc (2), said clutch release spring means (13) being free of

diaphragm spring supporting forces when said clutch release unit (20) acts onto said radially inwardly directed tongues (12) of said diaphragm spring.

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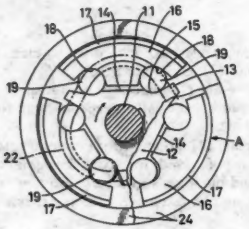
4,610,343

## TRANSVERSELY ENGAGED CENTRIFUGAL CLUTCH

Kazuo Hikari, Suita, Japan, assignor to Sanyo Coupling Co., Ltd., Suita, Japan

Filed Oct. 25, 1984, Ser. No. 664,870
Claims priority, application Japan, Dec. 12, 1983, 58-192006[U]
Int. Cl.[4] F16D *43/14*
U.S. Cl. 192—105 BA 4 Claims




1. A centrifugal clutch, comprising:

a primary shaft having a rotor thereon, for rotation about an axis of rotation;

a plurality of shoes surrounding said rotor in radially spaced relation thereto;

a plurality of elastomeric members having axes extending parallel to said axis of rotation, disposed in respective pairs of opposing grooves in said rotor on said shoes, each pair of opposing grooves including a first groove surface on said rotor contacting one side of the elastomeric member and a second groove surface radially outward of said first groove surface on an opposing one of said shoes contacting another side of said elastomeric member radially outward of said one side, said first and second groove surfaces having respective surface portions extending radially and converging in a radially outward direction;

elastic means, separate from said elastomeric members, for always clamping all of said shoes radially inward around said rotor against said elastomeric members such that a torque applied with respect to said axis of rotation so as to rotate said primary shaft and said rotor about said axis of rotation is transmitted through said elastomeric members to said shoes to rotate said shoes, said elastic means elastically resisting radially outward movement of said shoes from centrifugal forces, said elastomeric members being sufficiently movable in said pairs of grooves that said converging portions of said first and second said groove surfaces direct said elastomeric members radially outward into wedging engagement therewith in response to the centrifugal forces when said primary shaft and said rotor are rotated about said axis of rotation and said shoes are urged centrifugually outward;

a secondary shaft; and

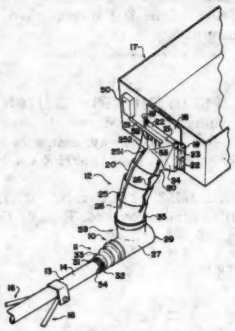
a cylinder fixed to said secondary shaft so as to enclose said shoes, for engaging said shoes to be rotated therewith when said shoes are urged centrifugally outward thereagainst.

4,610,344

## FILLING ATTACHMENT FOR A FEED TUBE

Curtis R. Eastman, Elfros, Canada, assignor to Lagrison Industries Ltd., Winipeg, Canada

Filed Jun. 1, 1984, Ser. No. 616,063
Claims priority, application Canada, Mar. 26, 1984, 450483
Int. Cl.[4] B65G *11/14, 33/08*
U.S. Cl. 193—5 12 Claims



5. A filling system for confining material to be fed into a feed tube, said system comprising a duct, and a substantially rigid hollow body separate from the tube and having a tubular section for surrounding a feed end of the tube, a collar for clamping around the tube and a tubular mouth section extending outwardly from one side of the tubular section, having an open mouth and providing a rim around said open mouth for receiving and closely surrounding the end of the duct, the body when clamped by said collar, being closed apart from said open mouth so as to confine the material fed from said duct to enter the feed tube, said duct comprising a plurality of separate tapered tubular buckets each of which has a narrower end projecting into the wider end of a next adjacent bucket to form a flexible substantially closed conduit through which material can pass to said open mouth of the mouth section, the axial length of the lowermost bucket being less than that of the other buckets.

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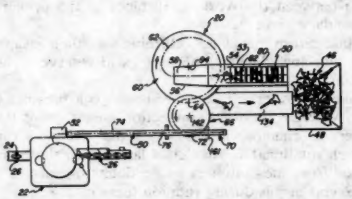
4,610,345

## METHOD AND APPARATUS FOR ORIENTING AND DELIVERING DISPENSER CAP ASSEMBLIES

George E. Spreen, Paramus; Hans Herold, Westwood, and Kazmier Wysocki, Hackensack, all of N.J., assignors to PMC Industries, Hackensack, N.J.

Filed Dec. 3, 1980, Ser. No. 212,635
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—392 57 Claims



1. The method of orienting and delivering dispenser cap assemblies of the type having a relatively heavier cap and a relatively lighter dip tube advanced along a path of travel from a bin containing randomly oriented cap assemblies to a discharge point where the cap assemblies are presented serially in

a prescribed orientation for capping operations, the method comprising the steps of:

feeding cap assemblies from the bin to an inlet location and imparting generally spiral movement to the cap assemblies outwardly from the inlet location to place the heavier caps of at least some of the cap assemblies outwardly relative to the respective lighter dip tubes of the cap assemblies;

allowing the outwardly-placed caps of the cap assemblies to drop downwardly relative to the inlet location ahead of the respective dip tubes of the cap assemblies so as to orient at least some of the cap assemblies with the caps thereof located below the respective dip tubes and place the oriented cap assemblies along a generally horizontal first segment of the path of travel;

inverting the oriented cap assemblies to re-orient and place the re-oriented cap assemblies along a generally horizontal second segment of the path of travel with the cap of each cap assembly lying above the respective dip tube, the first and second segments of the path of travel being located at different elevations such that the oriented cap assemblies follow an arcuate segment of the path of travel between the first and second segments as the cap assemblies are re-oriented; and

advancing the re-oriented cap assemblies along a generally horizontal third segment of the path of travel to the discharge point.

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**4,610,346**

## DEVICES FOR SEPARATING CONTIGUOUS ARTICLES

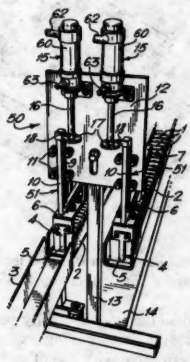
**John G. Phillipson, Peterborough, England, assignor to Baker Perkins Holdings PLC, Cambridgeshire, England**

**Filed May 10, 1984, Ser. No. 608,877**

**Claims priority, application United Kingdom, May 17, 1983, 8313543**

**Int. Cl.[4] B65G *47/26, 59/00***

**U.S. Cl. 198—425** **9 Claims**



1. A device for separating and holding back an advanced supply of contiguous laminar articles arranged in upright relationship, comprising:

a conveyor means for advancing a supply of contiguous laminar articles;

an upright-disposed separating member;

first means enabling sequential movement of the separating member;

(a) downwardly from an original position towards the advanced supply of articles;

(b) into the advanced supply between two adjacent articles and forwardly together with said supply;

(c) upwardly away from the advanced supply; and,

(d) rearwardly to the original position;

second means enabling only the upward movement of the separating member to take place as positive motion, whereas downward movement of the separating member is such that the separating member is free to make entry into the supply in a yieldable manner, said second means incorporating lost-motion means and comprising a fluid-operated, double-acting piston movable within a cylinder; and,

means for restricting outward flow of fluid from the cylinder on one stroke thereof to control the speed of downward movement of the separating member, whereby the articles are not damaged by the separating member.

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**4,610,347**

## DIVIDING DEVICE FOR COLLECTING COMMODITIES INCORPORATED IN A COMMODITY COLLECTING DEVICE

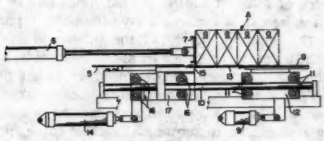
**Kenji Inoko, Shiga, Japan, assignor to Tetra Pak International Aktiebolag, Lund, Sweden**

**Filed Aug. 30, 1985, Ser. No. 771,210**

**Claims priority, application Japan, Sep. 3, 1984, 59-185263**

**Int. Cl.[4] B65G *47/26***

**U.S. Cl. 198—425** **1 Claim**



1. A dividing device for dividing collected commodities incorporated in a device for collecting commodities which aligns a predetermined number of commodities successively supplied by a conveyance conveyor and continually pushes them out sideways by a first pusher to regularly collect many commodities, said dividing device being characterized in that a floor onto which the collected commodity group is discharged by a second pusher is divided into front and rear floors with respect to the moving direction of the second pusher, the front floor on which a part of the commodites in the pushed out commodity group is placed being provided with means to move said front floor in the same direction as the moving direction of the second pusher so as to enable only said part of the commodities to be separated from other commodities in the group to be discharged, and a rear pusher engageable with the rear end of the commodity group pushed out by said second pusher is provided on the rear floor so that the remaining part of the commodities may be pushed out onto the front floor from which said part of the commodities have been discharged.

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**4,610,348**

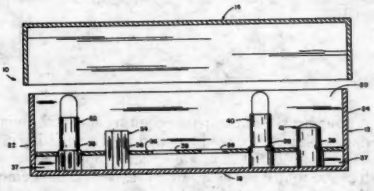
## CASE FOR DISPLAYING LIPSTICK

**Gloria A. Dailey, 9 Montauk Ct., St. Louis, Mo. 63146**

**Filed Apr. 12, 1985, Ser. No. 722,660**

**Int. Cl.[4] B65D *5/50***

**U.S. Cl. 206—45.19** **11 Claims**



1. In a package including means to receive and display a

plurality of lipsticks of the kind having a tube with lipstick protruding therefrom and having a removable cap to expose the protruding lipstick, a case for storing and displaying the lipstick with the caps removed and the lipstick protruding therefrom comprising a bottom section formed of rigid plastic and a top section formed of rigid plastic that together define an enclosure, the bottom section having a flat bottom panel adapted to support the case on a normally horizontal surface, the top section having a top panel, a generally flat tray within the bottom section of the case, means to support the tray with its upper surface in spaced substantially parallel relationship to the bottom panel, an even numbered plurality of holes through the tray adapted to receive a plurality of the lipstick-containing tubes and their caps, the tubes being of the kind having a flat base and having a removable cap and the holes being sized to receive either the tubes or the caps so that the uncapped tubes can be received in some of the holes with the lipstick colors exposed and the caps can be received in other of the holes, wherein some of the tubes are cylindrical in cross section and some of the tubes are polygonal in cross section, the minimum diameter of the holes being greater than the maximum diameter of most of the cylindrical tubes and the caps therefor and of the diameter of a circumscribed circle around and in contact with the vertices of most of the polygonal tubes and of the caps therefor, the height of the tray above the bottom panel being less than the mininum height of the tubes and of the caps therefor, the holes being spaced from one another by a distance greater than the thickness of the thumb or finger of at least most people, the top section being displaceable from the bottom section to allow access from above to the bottom section and being replaceable to substantially close the enclosure for protection against the entry of dust and particulates into the enclosure, means defining a side wall surround on one of the case sections extending between the bottom panel and the top panel, the height of the side wall surround being greater than the height of the tallest of most of the tubes and their exposed lipstick and of the respective caps therefor, whereby when the top section is displaced from the bottom section, each of the lipstick tubes can be passed through a hole and be placed with its base on the bottom panel and can be removed therefrom and each of the caps can be passed through a hole adjacent to its respective tube with an end of the cap resting on the bottom panel and can be removed therefrom, to thereby expose the lipstick colors, and whereby the top section can be replaced to close the enclosure thereby permitting the tubes to be stored uncapped without exposure to dust and foreign matter.

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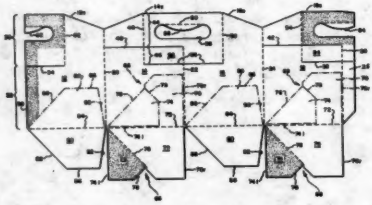
**4,610,349**

## FOUR-PACK BOTTLE CARRIER

**Arthur Schwartz, Amherst, and Paul O. Scott, Buffalo, both of N.Y., assignors to Wagner Folding Box Corp., Buffalo, N.Y.**

**Filed May 14, 1985, Ser. No. 734,032**
**Int. Cl.[4] B65D** *75/00*
**U.S. Cl. 206—175** **5 Claims**



1. A four pack bottle carrier requiring minimal gluing and materials, which can be readily glued up with existing machinery, which will lie flat after gluing and prior to erection, and which can be folded flat again after use; said carrier comprising a single piece paperboard structure having:

four side panels of substantially equal width, adjacent side panels being connected to each other by vertical fold line, each of the side panels consisting of upper and lower portions, the upper portions being divided from the lower portions by lower horizontal die cuts each of which extends horizontally only halfway through the width of an associated side panel, the upper portion of a first pair of opposed side panels being further provided with a full width upper horizontal die cut which divides the upper portion of each of the first pair of side panels into a top portion and an intermediate portion, the top portion above the full width die cut being glued to the upper portion of an adjacent one of a second pair of opposed side panels, and the intermediate portion between the lower and upper horizontal die cuts on said first pair of opposed side panels forming a bottle divider along with the glued top portion when the carrier is erected;

a glue flap to one side of one of said panels; and

two pairs of opposed bottom panels, the first pair of opposed bottom panels including a first portion connected to an adjacent side panel by a horizontal fold line, and a triangular glue flap secured to the first portion by another fold line, the triangular glue flap being glued to an adjacent bottom panel of the second pair of bottom panels.

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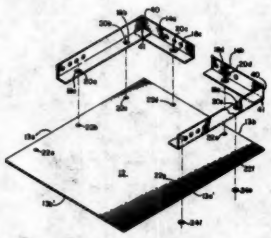
**4,610,350**

## PACKAGING FOR PAPER

**Douglas R. Johnson, 2671 Jenkintown Rd., No. 2, Glenside, Pa. 19038, and Nana Ribeiro, 415 Salisbury Rd., Wyncote, Pa. 19095**

**Filed Jul. 24, 1985, Ser. No. 758,548**
**Int. Cl.[4] B65D** *77/02, 85/62;* **B42F** *3/00*
**U.S. Cl. 206—216** **11 Claims**



1. A tray-shaped package for a stack of leaves of paper and the like which is adapted for conversion to a binder, comprising:

a panel of sheet material with mutually perpendicular end and side edges, said panel having its length and width substantially coextensive with one of said leaves of paper;

wall means of sheet material for laterally positioning the paper in registry with said panel;

attachment means for releasably attaching said wall means to said panel along its edges so that said wall means projects out of the plane of the panel;

said wall means having means for binding leaves of paper;

said wall means having a pair of transverse hinges and said attachment means securing said wall means with its transverse hinges overlying adjacent corners of said panel such that said wall means extends along adjacent edges of said panel to form a tray; and

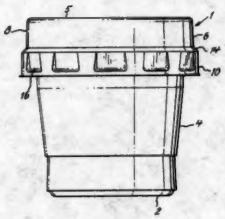
fastening means operable upon release of said attachment means for coupling said wall means to the panel in a different position along an edge thereof to expose said binding means whereby a binder is formed for said leaves from said panel and said wall means.

4,610,351

## INSULATED DRINKING CUPS

Robert E. Coles, and Alec T. Newman, both of Warwicks, Great Britain, assignors to General Foods Ltd., Banbury, United Kingdom

Continuation-in-part of Ser. No. 42,389, May 25, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,818
Int. Cl.[4] B65D *21/02, 62/00, 85/72*
U.S. Cl. 206—217 5 Claims



1. A nestable vending-type cup formed of thin gauge thermoplastic material comprising a base (2) a wall (4) integral with and upstanding from the base (2) to define therewith a liquid reservoir, said wall (4) turned over at its free end to from a collar (6) circumjacent the wall (4), said collar (6) characterized by inclining outwardly and extending downwardly from the wall (4) of the cup for at least 5 mm before a shoulder (14) is provided, said shoulder extending outwardly at a 45° angle from the collar and interposed midway between an upper portion (8) of the collar and a lower flared skirt portion (10), and having a multiplicity of uniformly spaced indents (16) located before the shoulder and on the periphery of the flared skirt portion (10), each of said indents (16) designed to increase the transverse rigidity of the collar such that when the collar is gripped by the user it remains spaced from the upstanding wall (4).

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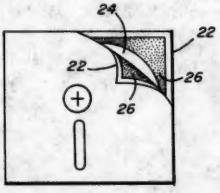
4,610,352

## NONWOVEN FABRIC

Jon A. Howey, Mansfield, and Randall J. Rogers, Millis, both of Mass., assignors to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 546,785, Oct. 28, 1983, abandoned. This application May 6, 1985, Ser. No. 730,987
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—313 7 Claims



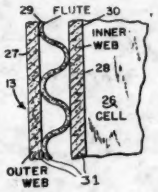

7. In a computer diskette having a plastic container, a nonwoven fabric liner disposed therein, and a flexible magnetic disk disposed thereon, in surface contact with said nonwoven liner, wherein the improvement comprises; a nonwoven liner having a homogeneous blend of Nylon 6 fibers and cellulosic fibers thermally bonded together in a plurality of recessed discrete bonding points; a void volume of at least 75%; and a surface bonding of 10%-40%.

4,610,353

## CONTAINER FOR STATIC-SENSITIVE ARTICLES

William I. Young, North Situate, Mass., assignor to Hy-Con Products, Inc., Framingham, Mass.

Filed Mar. 25, 1985, Ser. No. 715,203
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 3 Claims




1. Container for use with an article which can be damaged by static electricity, comprising:

(a) a plurality of walls forming a cell in which the article resides, each wall consisting of a sheet of corrugated board made up of an outer web, an inner web, and a corrugated flute web that is sandwiched between the inner and outer webs, each web being formed with a substantially uniform, electrically conductive dispersion of conductive carbon particles, wherein the walls have a surface conductivity and bulk conductivity in the range from $10^3$ to $10^9$ ohms/square.

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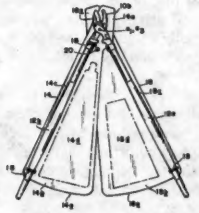
4,610,354

## MOUNTING AND DISPLAY CARD FOR HANDLE-OPERATED TOOL

Glenn Hostetler, Arcadia, Calif., assignor to S.M.S. Industries, Inc., Glendale, Calif.

Filed Sep. 25, 1985, Ser. No. 780,012
Int. Cl.[4] A45C *11/26*
U.S. Cl. 206—349 6 Claims



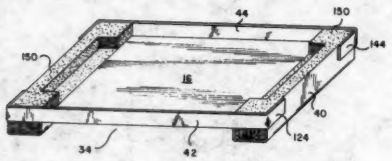
1. A mounting and display card for a tool of the type having a pair of pivotably interconnected jaws, each jaw being connected to a handle, and said handles being pivotably interconnected and adjustable between open and closed positions to open and close said jaws, said card comprising: a pair of overlapping panels, each panel having an upper portion adapted to underlie the jaws of said tool, and having a lower portion defining a display area with a margin adapted to underlie one of the handles of said tool; means for pivotably interconnecting said panels; and connecting means for detachably securing each handle of said tool to one of said panels, said panels being dimensioned and configured such that when the handles of said tool are closed, the display area of one panel is overlapped and hidden from view by the display area of the other panel, and when the handles of said tool are opened, the display areas of both panels are visible.

**4,610,355**

## SHIPPING BASE HAVING AN ENTRY SLOT FOR MECHANICAL MATERIAL HANDLING EQUIPMENT

**Donald J. Maurer, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa**

**Filed May 9, 1985, Ser. No. 732,110**
**Int. Cl.[4] B65D *19/00***
**U.S. Cl. 206—386** **7 Claims**




1. A shipping base for protecting the bottom of a load and elevating said load to provide an entry slot adapted for insertion of projecting prongs from a lifting device, comprising:

a rectangular horizontal panel having a first pair of opposing parallel edges and a second pair of opposing parallel edges, said first pair of opposing parallel edges being perpendicular to said second pair of opposing parallel edges;

a pair of rectangular vertical channels disposed along and integrally connected to said first pair of opposing parallel edges, said entry slot being defined by the space between said channels and below said horizontal panel;

each of said channels having an inner rectangular vertical wall attached to said first pair of opposing parallel edges, a bottom wall and an outer rectangular vertical wall, said outer walls being greater in height than the vertical distance between the bottom of said channel and said horizontal panel, said outer walls defining a first pair of upwardly extending rectangular vertical panels;

a second pair of upwardly extending rectangular vertical panels integrally connected to said second pair of opposing parallel edges, each of said second vertical panels having a pair of opposing transverse edges contiguous to said first pair of vertical panels, said first and second pair of vertical panels defining an open rectangular enclosure for partially enclosing said load, said panels and said channels being integrally formed from a unitary sheet of cardboard;

a quadruplicate of vertical flaps, each of said flaps being integrally attached to one of said opposing transverse edges of said second pair of rectangular vertical panels, said flaps being orthogonally bent from said second pair of panels thereby being adjacently disposed to said first pair of vertical panels, said flaps being integrally formed from said unitary sheet of cardboard;

means for attaching said flaps to said first pair of vertical panels thereby forming a rigid shipping base; and

a pair of rectangular polymer pads for partially enclosing and protecting said load, each of said pads being positioned in each of said channels for supporting said load.

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**4,610,356**

## CHRISTMAS TREE PACKAGING SYSTEMS AND STANDS

**Stanley P. Porter, Dallas, Tex.; John H. Williams, Tulsa, Okla., and William W. Avery, Plumtree, N.C., assignors to Fraser Firs For Christmas, Newland, N.C.**

**Filed Sep. 27, 1984, Ser. No. 656,014**
**Int. Cl.[4] B65D *85/00, 85/52***
**U.S. Cl. 206—423** **21 Claims**

1. In a tree stand of the type adapted to support a Christmas tree, the combination comprising:

(a) a stand base having a bottom pan portion and a peripheral rim portion whereby said stand base is adapted to contain water;

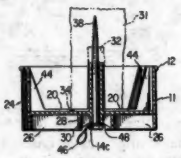
(b) a peg extending upwardly from the pan portion of said stand base;

(c) an elongated axial bore extending through said peg from the underside of said pan portion to the top end of said peg;

(d) a bolt receivable within said peg bore and longer than said peg bore whereby, when a tree is in place on said peg, said bolt protrudes from the upper end of said peg to secure the tree to said stand.

10. In a tree stand of the type to adapted to support a Christmas tree, the combination comprising

(a) a stand base having a bottom pan portion and a peripheral rim portion, said rim portion extending upwardly from




said pan portion whereby said stand base is adapted to contain water and extending downwardly from said pan portion to form a lower peripheral rim portion;

(b) a peg extending upwardly from the pan portion of said stand base and formed integrally therewith;

(c) a downwardly extending projection below said peg and depending from the underside of said pan portion, said projection being formed integrally with said stand base, and

(d) a rib assembly on the underside of said pan portion to impart structural rigidity to said stand base, said rib assembly comprising a plurality of ribs secured integrally to said downwardly extending projection and extending radially outward therefrom to said lower peripheral rim portion and formed integrally therewith.

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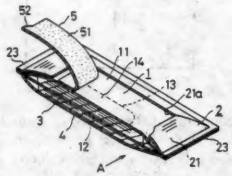
**4,610,357**

## DISPENSER-CONTAINER CONTAINING WET AND DRY CONTENTS AND PROCESS FOR MANUFACTURING THE SAME

**Kenji Nakamura, 3-7, Nishiawaji 6-chome, Higashiyodogawa-ku, Osaka, Japan**

**Continuation-in-part of Ser. No. 585,629, Mar. 7, 1984, which is a continuation of Ser. No. 388,963, Jun. 16, 1982, abandoned, which is a continuation of Ser. No. 210,682, Nov. 26, 1980, abandoned. This application May 8, 1985, Ser. No. 731,836**
**Claims priority, application Japan, Feb. 26, 1985, 60-37074; Feb. 26, 1985, 60-27024[U]**
**Int. Cl.[4] B65D *81/24***
**U.S. Cl. 206—449** **11 Claims**




1. A dispenser-container containing wet fibrous materials and dry materials separated from each other, comprising:

an inner container made of a gas impervious material and containing said wet fibrous materials;

said inner container including one of a first opening and a first weakened line for forming said first opening, to permit dispensing of said wet fibrous materials therethrough;

a flexible flap for releasably covering said first opening, and including a pressure sensitive adhesive which permits said flap to be repeatedly attached to and removed from said inner container;

an outer container containing both said inner container and said dry materials stacked together;

said outer container including a first surface having one of a second opening and a second weakened line for forming said second opening, at a position corresponding with said first opening; and

said outer container including a second, opposite surface having one of a third opening and a third weakened line for forming said third opening, to permit dispensing of said dry materials therethrough.

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**4,610,358**

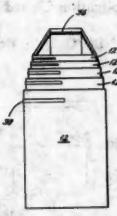
## TELESCOPING CONTAINER ASSEMBLY

**Thomas H. Walter, 12 Water St., B-4, Mystic, Conn. 06355**

**Filed Oct. 4, 1984, Ser. No. 657,578**

**Int. Cl.[4] B65D** *21/02, 33/30, 33/18*

**U.S. Cl. 206—514** **20 Claims**



**1.** An assembly of individual disposable closeable, reopenable and recloseable double sealed biodegradable containers, having successively next smaller containers of said assembly telescopingly housed within successively next larger containers of said assembly for serial individual use and removal of said containers from said assembly beginning with the most interior and therefore smallest container of said assembly, a closure portion of each container when actuated having first and second serially disposed seals separating the container contents from ambient air, each container comprising:

1. a longitudinally elongated biodegradable rigid hollow body including a closed base end and an open mouth end opposite said base end;
2. a closeable, reopenable and recloseable closure at said mouth end of said elongated body, comprising:
   a. a biodegradable longitudinally elongated foldable hollow cap portion continuously joining said mouth end of said body about the periphery thereof to define a continuous joint therebetween;
   b. said cap portion extending longitudinally from said joint to define an aperture generally transverse to the longitudinal axis of said container, said aperture defining an open end of said cap portion remote said continous joint when said first and second seals are inoperative;
   c. said cap portion including pairs of flexible folding hinge portions extending on opposite sides of said cap portion in isoceles triangular V-shapes having their triangular bases defined by cap-body juncture with vertices of said Vs at substantially said aperture, said flexible folding hinge portions being defined by weakening lines formed in said cap portion for folding of said cap portion therealong including along the legs of said "V", legs of said V-shapes longitudinally extending substantially to said joint, said longitudinally extending oppositely opposed surfaces of said cap defined by said V-shaped flexible hinge portions being foldable at juncture thereof with said body by application of hand pressure to external surfaces thereof inwardly towards each other until reaching positions at which the entire interior surface of said cap bounded by said aperture contacts itself and closes said aperture;
   d. pressure sensitive adhesive strip means extending circumferentially completely about said interior surfaces of said cap proximate said aperture, for releasably maintaining said cap portion closed and thereby defining said first seal by securing together said contacting entire interior surface of said cap bounded by said edges of said aperture by contact of portions of said pressure sensitive adhesive strip means one with another;
   e. deformable band means, secured to the exterior of said cap generally parallel with and extending past both ends of an edge portion of said aperture, where said edge portion at which said band means is attached is positioned circumferentially about said aperture midway between said vertices of said isoceles triangular Vs with said band extremities extending part way along said bases of said isoceles triangular V-shaped hinge portions, for retaining said container closed upon wrapping deformable band end portions about a portion of said cap after said aperture has been closed by folding said V-shaped hinge portions towards one another and first contacting said pressure sensitive interior adhesive strip surfaces within said cap and located proximate said aperture by adherence of said contacted portions of said pressure sensitive adhesive strip means one to another and then folding the portions of said cap, which were adjacent said edges which defined said aperture prior to contact of said interior pressure sensitive adhesive strip surfaces, at least one time over one another about said band along a line between said vertices of said isoceles triangular hinge members and towards said body of said container with said folding defining a reopenable and recloseable seal firstly encountered by contents of said container and said contacting pressure sensitive adhesive strip means defining another reopenable and recloseable seal serially encountered by contents of said container after encountering said firstly encountered seal upon said contents being removed from said container via said aperture.

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**4,610,359**

## METHOD FOR RECOGNIZING AND SORTING ARTICLES

**Ernst-August Müller, Hamburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 22, 1984, Ser. No. 582,444**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306175**

**Int. Cl.[4] B07C** *5/02*

**U.S. Cl. 209—3.1** **8 Claims**

**1.** Method for recognizing and sorting articles, each article having predetermined data associated therewith corresponding to the source of the article, the method being carried out with the use of at least one reading station including an optoelectronic sensor for forming an image pattern of each article, an evaluation device connected to the optoelectronic sensor and storing respective predetermined sorting criteria corresponding to respective ones of the image patterns to be formed by the optoelectronic sensor, a transporting device which transports the articles underneath the optoelectronic sensor, the transporting device including an endless transporting belt having a conveying surface with a longitudinal dimension and ribs disposed across the conveying surface transversely to its longitudinal dimension for subdividing the conveying surface into a plurality of sections, and a plurality of insertion stations

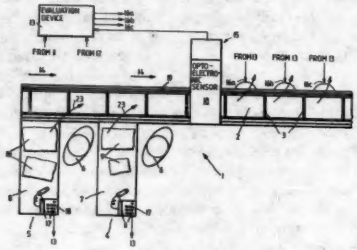
located adjacent the transporting device upstream of the reading station from which articles are placed onto the transporting device, comprising:

generating input signals representing the predetermined data associated with each article before the respective article is placed onto the transporting device;

feeding the input signals for each respective article to the evaluation device;

placing each article from a respective one of the insertion stations onto the belt into a respective, pre-assigned belt section associated with said respective one of the insertion stations;

transporting each article past the optoelectronic sensor in an aligned position relative to the optoelectronic sensor and



with the conveying surface of the belt forming an oblique angle with a horizontal plane, the angle opening in a direction normal to the longitudinal dimension of the conveying surface;

producing image data, with the use of the optoelectronic sensor, representing the image pattern for each respective article as it is transported past such sensor;

feeding the image data to the evaluation device;

processing the image data for each article in the evaluation device to associate the corresponding sorting criteria with the respective article and to record the source of that article; and

automatically removing each article from its pre-assigned belt section at a separation station selected by the sorting criteria associated with that article.

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**4,610,360**

## INSTALLATION FOR STACKING PILES OF LUMBER SEPARATED BY STICKS

**Hasse Forslund, Illervägen 7, S-862 00 Kvissleby, Sweden**

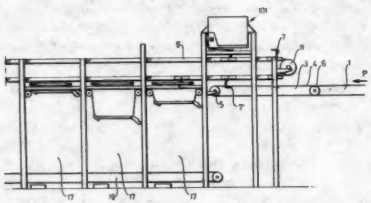
**PCT No. PCT/SE83/00004, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02440, PCT Pub. Date Jul. 21, 1983**

**PCT Filed Jan. 17, 1983, Ser. No. 537,392**

**Claims priority, application Sweden, Jan. 19, 1982, 8200273**

**Int. Cl.⁴ B07C *5/14***

**U.S. Cl. 209—518** **14 Claims**



1. An installation for production of piles of lumber, each pile comprising a plurality of layers of lumber with adjacent layers being separated by sticks, which installation includes a number of sink-compartments (17) to receive various lumber types and a lumber conveyor (9) to bring lumber from a loading point of unsorted lumber to a selected sink compartment, said lumber conveyor further being designed to bring the sticks (111) that are required for separating adjacent layers to the selected sink-compartment, and wherein the lumber conveyor includes a couple of endless chains (15) which are laid around sprockets (11) located in one and the same horizontal plane and continue over all the sink-compartments (17) and which chains between them support a means (71*a*,71*b*) for grasping and fetching said sticks from a stick hopper (103) and for depositing the grasped sticks in a selected sink-compartment.

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**4,610,361**

## CONVEYOR AND ASSOCIATED CONTROL SYSTEM FOR SORTING POULTRY CARCASSES

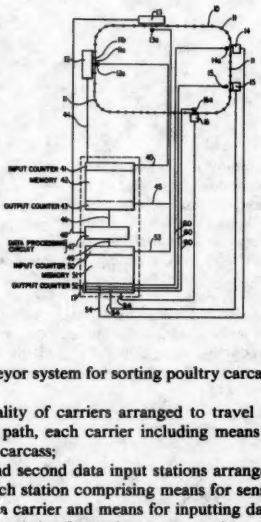
**Eric Elliot, Athens, Ga., assignor to AutoSystems Limited, Yorkshire, England**

**Continuation of Ser. No. 570,340, Jan. 13, 1984, abandoned, which is a continuation of Ser. No. 451,222, Dec. 20, 1982, abandoned, which is a continuation of Ser. No. 308,872, Oct. 5, 1981, abandoned, which is a continuation of Ser. No. 186,996, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 927,063, Jul. 21, 1978, abandoned. This application Oct. 29, 1984, Ser. No. 666,019**

**Claims priority, application United Kingdom, Jul. 23, 1977, 31025/77**

**Int. Cl.⁴ B07C *5/36*; B65G *47/50***

**U.S. Cl. 209—555** **9 Claims**



1. A conveyor system for sorting poultry carcasses comprising:

(a) a plurality of carriers arranged to travel in succession along a path, each carrier including means to support a poultry carcass;

(b) first and second data input stations arranged along said path, each station comprising means for sensing the presence of a carrier and means for inputting data relating to a characteristic of a poultry carcass, said means for inputting data at said first data input station being adapted to input first data different from said data capable of being inputted by said data input means at said second data input station;

(c) a plurality of release stations along said path downstream of said data input stations, each said release station comprising detecting means for detecting the presence of a carrier and means for removing a poultry carcass from a carrier; and

(d) control means comprising:

(1) a first memory means having an input and an output,

(2) a first input counter section connected to the input of said first memory means,

(3) a first output counter section connected to the output of said first memory means,
(4) a second memory means having an input and an output,
(5) a second input counter section connected to the input of said second memory means,
(6) a second output counter section connected to the output of said second memory means and comprising a plurality of counters, each counter being associated with one of said release stations,
(7) data processing means for classifying poultry,
(8) means connecting said data processing means to said first output counter section and to said second input counter section,
(9) means connecting said sensing means at said first data input station with said first input counter section and means connecting said data input means at said first data input station with said first input counter section whereby data associated with each successive poultry carcass is stored successively in said first memory means,
(10) means connecting said data input means at said second data input station with said data processing means and means connecting said sensing means at said second data input station with said first output counter section and with said second input counter section whereby each successive first data is transmitted from said first memory means to said data processing means, said data processing means associates successive first data with successive second data and generates classifying data for each successive poultry carcass, and said classifying data is successively stored in said second memory means, and
(11) separate means connecting each of said detecting means at said release stations with the respective associated counter of said second output counter section and separate means connecting each of the associated counters of said second output counter section with each of said poultry carcass-removing means at the respective release station whereby the presence of a poultry carcass on a carrier at a release station causes the transmission of the classifying data associated with said poultry carcass to be transmitted to said release station and said poultry carcass to be removed from said carrier at a predetermined one of said release stations,

(e) whereby said conveyor system maintains an individual identification of said poultry carcass carriers passing through each of said stations independent of the distance between said carriers and independent of the time lapse between a poultry carcass carrier passing one station and the next station.

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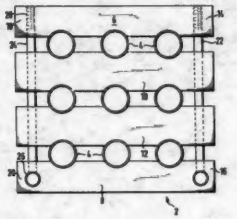
## FRAME FOR THE TRANSPORT AND STORAGE OF PIPES

**Thomas E. Remp, 5555 Del Monte Dr. T-2, Houston, Tex. 77056; Wilfried Dreyfuss, Dorfstr. 52, 3111 Eimke, and Kurt Müller, Mühlenweg, both of Fed. Rep. of Germany, assignors to Wilfried Dreyfuss, Fed. Rep. of Germany and Thomas E. Remp, Houston, Tex.**

**Filed Jul. 20, 1982, Ser. No. 400,096**
**Int. Cl.[4] A47F *7/00***
**U.S. Cl. 211—59.4** **33 Claims**

1. Frame for the transport and storage of pipes having several profiled frame parts arranged one over another, and having upper and lower frame parts connectable with one another and middle frame parts, said upper and lower frame parts being connectable with one another by at least one bolting rod means, said bolting rod means being insertable into one of said frame parts and swingably borne therein, the improvement comprising, said upper and lower frame parts having an outer side and an outer wall, said outer side having a channel-type depression therein extending along a generally horizontal axis defined by said outer side, and said depression having a bottom



surface and side walls, said bottom surface being joined by reinforcing walls with said outer wall of said frame part.

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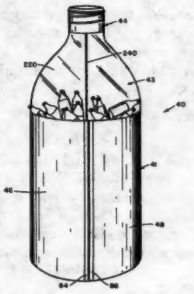
## CONTAINER ASSEMBLY FOR STORAGE AND DISPLAY OF ARTICLES

**Paul Flum, Ladue, and Jerry M. Mynatt, Desoto, both of Mo., assignors to Paul Flum Ideas, Inc., St. Louis, Mo.**

**Filed Mar. 4, 1985, Ser. No. 708,034**
**Int. Cl.[4] A47F *7/28***
**U.S. Cl. 211—74** **27 Claims**



1. A container assembly for containing and displaying products comprising a hollow cylindrical body defined by resilient normally flat panel means curved to form a cylindrical side wall and a removable round floor member within and at the base of the cylindrical side wall, fastening means for joining side edges of the panel means to releasably form the panel means in a cylindrical shape, partition means within the cylindrical body having side edges in contact with the inner side wall of the cylindrical body and having bottom edges that contact the floor member, means defining joists extending transversely between opposite points on the inner side wall of the cylindrical body, means on the side wall for removably supporting the joists, the floor member being positioned to rest upon the joists for reinforcement of the floor, and means defining grooves at selected positions within the cylindrical body to receive selected edges of the partition means.

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**4,610,364**

## CLOTHES DRYER LOWER CROSS ASSEMBLY

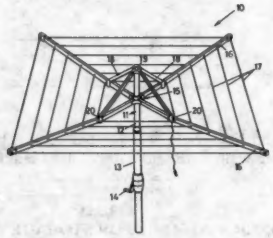
**Ronald G. Meade, Edwardstown, Australia, assignor to Hills Industries Limited, Edwardtown, Australia**

**Filed Nov. 26, 1984, Ser. No. 674,542**
**Claims priority, application Australia, Nov. 24, 1983, PG2543**
**Int. Cl.[4] A47F *5/00***
**U.S. Cl. 211—183** **6 Claims**

1. Clothes dryer lower cross assembly for an elevating

clothes dryer of the type having arms which radiate from a lower cross itself slidable over a stem, said arms being guided by stays pivoted at their upper ends to an upper cross and at their lower ends to respective said arms intermediate the ends thereof,

said lower cross having a plurality of outwardly radiating pairs of lugs, the lugs of each pair being parallel and retaining between them a respective pin about which a respective one of said arms is pivotal,



a cover having side walls which extend from an end portion and which lie contiguous with the outer surfaces of said lugs and the ends of said pins to thereby retain said pins in their respective said lugs and said cover having a plurality of openings respectively in registry with the space defined between each said pair of lugs, each said opening being adapted to allow the corresponding one of said arms to extend therethrough for pivoting of said arms about the respective pins,

and retention means releasably retaining the cover to the lower cross.

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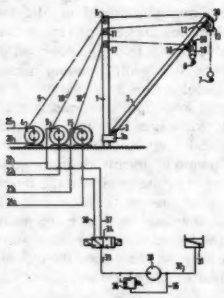
## HOISTING MEANS INCLUDING CONSTANT TENSION HOIST WIRE

**Harald Roed, Vatne, Norway, assignor to A/S Hydraulik Brattvag, Brattvag, Norway**

**Filed Dec. 6, 1983, Ser. No. 558,949**
**Claims priority, application Norway, Dec. 6, 1982, 824082**
**Int. Cl.[4] B66C *23/82***
**U.S. Cl. 212—262** **8 Claims**



1. Hoisting means which includes a mast, a boom or a crane having one end pivoted to said mast about a horizontal axis and comprises:

a plurality of hoist wires each having its own respective cargo hook;

spaced upper, lower and middle pulleys on said mast;

a topping wire passing over said upper pulley and fixed at its outer end to said boom for raising and lowering said boom;

individual hoist wire operating driving means for operating said respective hoist wires and said topping wire;

a plurality of cargo winches each having a hoist wire, one of said hoist wires passing over said lower pulley and the other of said hoist wires passing over said middle pulley on said mast, said hoist wires each having hooks at their outer extremities extending beyond said boom and hook stopping means, one or each said hoist wires, pivotally mounted on said boom for holding said hooks in an inactive position by ensuring said constant tension on said associated wires, said wires passing through said hook stopping means; and

common power supply means for said drive means;

a change-over device connecting said power supply means to each said hoist drive means whereby a constant tension can be applied to each wire, each said drive means being adapted to pay out their said respective hoist wire if the pull on the said respective hoist wire exceeds said constant tension and to take in said hoist wire if the pull on said hoist wire falls below said constant tension;

said change-over device comprising a selection valve having alternative positions, a first control conduit connected between said selection valve and said other hoist wire passing over said middle pulley and a second control conduit connected between said selection valve and said one hoist wire passing over said lower pulley, and means for supplying pre-regulated pressure to said respective drive means for each said winches separately.

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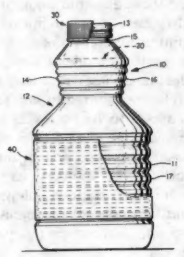
## ROUND JUICE BOTTLE FORMED FROM A FLEXIBLE MATERIAL

**Ann E. Estes, Toledo, and Donald J. Staczek, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Nov. 25, 1985, Ser. No. 801,275**
**Int. Cl.[4] B65D *23/00***
**U.S. Cl. 215—1 C** **30 Claims**



1. A bottle that is adapted to be filled with a liquid product that is at an elevated temperature, said bottle being formed from a flexible material that includes at least a structural layer of a polymeric material with a softening temperature that permits said structural layer to retain sufficient strength to keep said bottle from collapsing when said structural layer becomes heated as a result of the filling of said bottle with said liquid product when said product is at said elevated temperature, said bottle comprising, in combination:

an open top through which said bottle is adapted to be filled with said liquid product added to a closed bottom; and

a body portion having a central axis, said central axis extending generally vertically when said bottle is in an upright position, said bottom of said bottle being adapted to be supported on a horizontal surface when said bottle, is in said upright position, said body portion being generally circular in a plane extended transversely of said central axis of said bottle said body portion having corrugation means extending around said body portion, said corrugation means being adapted to at least partially collapse in a

direction extending parallel to said central axis of said bottle after the filling of said bottle with said liquid product at said elevated temperature and the capping of said bottle while said product is still at an elevated temperature to accommodate the cooling of said liquid product after the filling and capping of said bottle, and to thereby substantially prevent deflection of said body portion of said bottle in a plane extending transversely of said central axis of said bottle due to the cooling of said liquid product.

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## TAMPER-PROOF CLOSURE

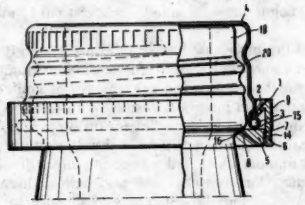
**Philipp Massott, Neckargemünd, and Heinz Leonhardt, Bedburg, both of Fed. Rep. of Germany, assignors to Vaw-Folien-Verarbeitung GmbH, Fed. Rep. of Germany**

**Filed Mar. 13, 1985, Ser. No. 711,301**

**Claims priority, application European Pat. Off., Mar. 13, 1984, 84102724.6**

**Int. Cl.[4] B65D *41/34***

**U.S. Cl. 215—252** **4 Claims**



1. A closure for sealing threaded bottles, jars, or similar containers, comprising:

(a) a circular plastic sealing ring, comprising a collar having a downwardly extending annular stop integrally formed with said collar, an inwardly protruding peripheral lip extending from the upper portion of said collar, and a security ring having a diameter smaller than that of said collar and attached to the inner surface of said collar by a plurality of fracturable retaining bridges, said annular stop limiting the outward movement of said security ring; and

(b) a metallic cap including a rolled rim retained in the gap between said security ring and said peripheral lip.

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**4,610,368**

## TABLEWARE BASKET FOR A TABLEWARE WASHER

**Tsutomu Hasebe, Kashiwa, Japan, assignor to Tezuka Kosan Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 30, 1985, Ser. No. 771,001**

**Claims priority, application Japan, Sep. 3, 1984, 59-132674[U]**

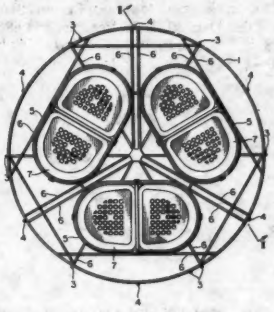
**Int. Cl.[4] B65D *6/08, 1/36***

**U.S. Cl. 220—19** **2 Claims**

1. A tableware basket for the tableware washer comprising:

in the tableware basket for use with the tableware washer wherein the tableware basket placed in the tableware basket for the tableware washer is rotatable, and the washing liquid in the washing tank is also rotatable,

at least upper and lower ring wires **1, 2** constituting a peripheral edge pivotally shaped in the washing tank, a plurality of connecting wires **3, 4** spaced for connecting said upper and lower ring wires, and accomodating division lines **5** dividing a plurality of accomodating divisions in a plain form are provided, and within said respective accomodating division lines are the holding basket zones **7** enabling



spoon **8**, fork **9**, knife **10**, etc. to be held in upstanding positions.

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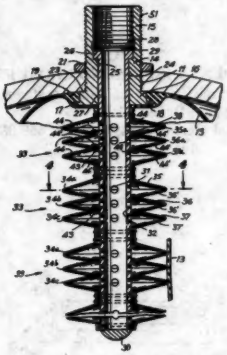
## PRESSURE VESSEL

**Jacques H. Mercier, 14 rue des Sablons, 75116 Paris, France**

**Filed Oct. 7, 1985, Ser. No. 785,340**

**Int. Cl.[4] F16L *55/00***

**U.S. Cl. 220—85 B** **12 Claims**



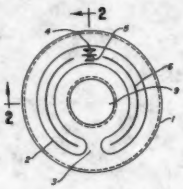
1. A pressure vessel comprising a rigid container having a deformable partition therein defining two chambers for fluids, each having a fluid port leading thereinto, an elongated central guide member for said partition in one of said chambers, said central guide member comprising a rigid tube extending axially in said container having at least one end secured to one of said ports, said tube having apertures therethrough, a flexible closure member encompassing said tube and the apertures thereof, said closure member having a plurality of closure elements normally extending radially outward from said tube, each closure element comprising a pair of spaced walls joined at their outer ends, one of said walls having apertures therethrough, whereby when said partition is forced inwardly against said flexible closure member to force said flexible closure member against said tube, an apertured portion of one of said walls will be aligned with an uninterrupted portion of an associated wall to prevent extrusion of said partition through the apertures in said tube.

4,610,370

## PRESSURE RELEASE VENT

Gregory A. Patterson, and Melvin S. Good, both of North Vancouver, Canada, assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 30, 1985, Ser. No. 814,686
Int. Cl.[4] F16K *17/40*
U.S. Cl. 220—207 20 Claims



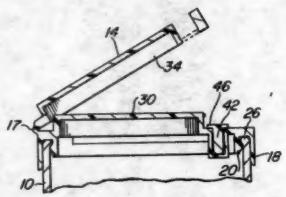

1. A pressure release vent for a container comprising a container wall having an indentation which is interrupted by at least one hollow rib with the apex of said rib connecting the opposing sidewalls of said indentation at a distance above the bottom of said indentation which is equal to about 5% to about 75% of the depth of said indentation and said hollow rib having a score line traversely across it, whereby excessive pressure in the container will tear the container wall at said score line and vent said container.

4,610,371

## TAMPER EVIDENT DISPENSING CLOSURE ASSEMBLY

Kenneth G. Karkiewicz, Berlin, N.J., assignor to Dougherty Brothers Company, Buena, N.J.

Filed Oct. 9, 1984, Ser. No. 659,057
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—266 9 Claims



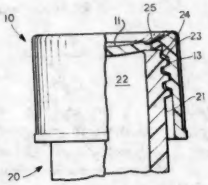

1. A tamper-evident dispensing closure assembly comprising: a closure having a periphery adapted for attachment to the open end of a container, said closure having a wall containing a dispensing opening; a cover movably connected to said closure for movement between a closed position and an open position with respect to said opening; and means on said assembly for evidencing tampering including a pin attached directly to said cover by a weak zone, said pin having a projecting portion at one end and an exposed portion at its opposite end, said projecting portion of said pin engaging a recess in said wall of said closure in a force fit relationship upon moving said cover to its closed position, said weak zone severing as a result of movement of said cover to its open position from said closed position, said projecting portion of said pins remaining engaged in said recess after opening and said exposed portion evidencing tampering.

4,610,372

## SELF-SEALING CLOSURE FOR SMALL CONTAINERS

Peter T. Swartzbaugh, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 8, 1985, Ser. No. 752,769
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—288 22 Claims




1. A package comprising, in combination:

a container comprising an open mouth, a finish surrounding said open mouth, and a helical thread projecting outwardly from said finish, said finish having a thin and accurately formed top, the outside diameter of said helical thread being not substantially greater than 15 millimeters; and

a molded thermoplastic linerless closure sealingly engaging said container, said closure further comprising:

a top panel spanning said open mouth of said container;

an annular skirt integrally formed with said top panel and surrounding at least the upper portion of said finish; and

a helical thread integrally formed with said top panel and said annular skirt and projecting inwardly from said annular skirt and engaging said helical thread on said finish to removably secure said closure to said container;

wherein said top panel of said closure comprises a central portion which is depressed from the top of said annular skirt of said closure to lie within said open mouth of said container;

wherein said top panel of said closure further comprises an annular portion surrounding said central portion and extending radially outwardly and upwardly from said central portion to said top of said annular skirt; and

said annular portion of said top panel of said closure and said top of said annular skirt of said closure forming a pocket, said pocket sealingly engaging the top of said finish of said container and a portion of the inside surface of said finish of said container.

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## BALL DISPENSER

William A. Sherbondy, Cleveland, Ohio, assignor to Jallmar Industries Inc., Cleveland Heights, Ohio

Continuation of Ser. No. 677,043, Nov. 30, 1984, abandoned.
This application Oct. 22, 1985, Ser. No. 790,757
Int. Cl.[4] B60R *9/08*
U.S. Cl. 221—155 3 Claims

1. A golf ball dispenser comprising a tube into which a stack of golf balls can be loaded, a base at the bottom of said tube, a cap at the top of said tube, a resilient coil spring disposed for urging balls of the stack upwardly in said tube, a ball-accepting and dispensing side aperture near the top of said tube, said aperture being substantially nondeformable and disposed for retaining in said tube the balls that are out of register with said aperture, said aperture being substantially out of dispensing register with the two topmost balls of said stack when said dispenser is loaded and said stack is at rest, the top of said aperture being substantially below the top of said tube, the sides of said aperture being rounded, the direct projection of said aperture being broadly similar to and slightly larger than that of a golf ball which is to pass therethrough, said aperture

having a finger notch that extends therefrom towards said base a distance sufficient for exposing part of the exterior surface of the first two balls stacked under the topmost ball,

and an access means in said cap for manually depressing the topmost ball of the stack into dispensing register with said aperture.

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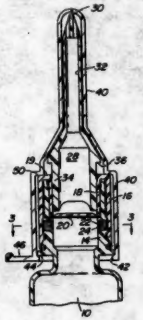
## APPARATUS FOR MIXING FLOWABLE MATERIALS IN SEALED CONTAINERS

John D. Buehler, Bridgeton, N.J., assignor to Dougherty Brothers Company, Buena, N.J.

Filed Oct. 29, 1984, Ser. No. 665,585
Int. Cl.[4] B67B 7/24
U.S. Cl. 222—83 7 Claims



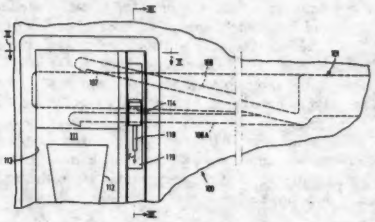
1. Apparatus for use in mixing flowable materials comprising a first container having a first material therein adapted to be mixed with a second material in a second container, said first container having a hollow dispensing member coaxial therewith and terminating in a piercing tip at one end thereof, said dispensing member being movable in an axial direction relative to said first container to selectively control flow from said first container, said first container having a portion movable in a circumferential direction for facilitating introduction of air in a radial direction into the first container to replace material dispensed therefrom, and a shield telescoped over said dispensing member and said movable portion, said shield protecting said dispensing member from movement relative to said first container while said shield is attached to said first container.

4,610,375

## REFRIGERATOR DOOR WITH DRINK DISPENSER

Franco Germi, Gavirate, and Franco Moretti, Varese, both of Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1984, Ser. No. 677,702
Claims priority, application Italy, Dec. 6, 1983, 23764/83[U]
Int. Cl.[4] B67D 5/62; F25D 23/12
U.S. Cl. 222—131 4 Claims



1. A refrigerator door which comprises an inner panel and an outer panel forming the wall of the door; a drink container removably associated with the inner panel; a drink-delivery tube communicating with the interior of the container, said tube being hingedly movable against a resilient bias from an inoperative position to a delivery position, the tube extending through the wall of the door and terminating in a spout; a slide associated with said tube for effecting said movement thereof and being movable from the outside of the door in a vertical opening formed in the outer panel of the door wall; a compartment in said door accessible from the outside of the door without opening the same, said compartment being divided into a lower compartment for placement of a cup and an upper compartment for reception of the tube spout; and a pivotal partition controllable by the slide and separating the lower compartment from the upper compartment.

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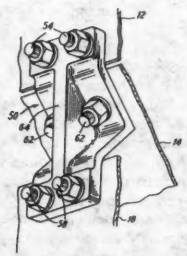
4,610,376

## BULK STORAGE CONTAINERS

Robert M. Regent, Hepworth, England, assignor to A. [illegible]Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Jan. 9, 1984, Ser. No. 569,170
Claims priority, application United Kingdom, Jan. 10, 1983, 8300546
Int. Cl.[4] B67D 5/06
U.S. Cl. 222—185 5 Claims



1. A bulk storage container comprising:
a body section of vertical generally-cylindrical shape;
a tapering conical section adapted to be joined to said body section at the lower end thereof;
outlet means at the lower end of said tapering conical section;
a separate skirt section around said conical section and the

same diameter as said body section; and said skirt section extending downwardly of said outlet means and constructed and arranged to support the container in a vertical operating position, and

a plurality of joint members arranged side by side around the periphery of said body section and mounting said body section on said skirt section so as to be spaced vertically above said skirt section;

each said joint member including:

(a) first attachment means connected to said body section;

(b) second attachment means vertically spaced from said first attachment means and connected to said skirt section whereby the supporting force of the body section is transmitted through said joint members; and

(c) third attachment means connected to said conical section to secure it to said body section; said third attachment means being located between said first and second attachment means and accessible from the exterior of the container with the joint member connected to the body section and the skirt section.

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**4,610,377**

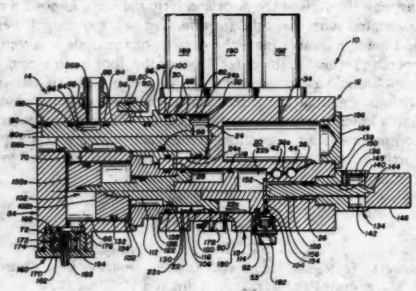
**FLUID DISPENSING SYSTEM**

**Robert Rasmussen, Minneapolis, Minn., assignor to Progressive Assembly Machine Co., Inc., Plymouth, Minn.**

**Filed Sep. 14, 1983, Ser. No. 532,503**

**Int. Cl.[4] G01F *11/06, 11/30, 11/36***

**U.S. Cl. 222—288** **4 Claims**



1. A dispensing system for pumping fluid in metered quantities comprising:

a manifold defining a first circular in cross section cavity having a first cavity diameter and a second cavity;

a pump head including third and fourth cavities alignable with said first and second cavities to define first and second cylinders;

an inlet valve carried within said first cylinder and shiftable between open and closed positions, said inlet valve including a circular in cross section first cavity insertion portion received within said first cavity, said first cavity insertion portion having a largest diameter no larger than said first cavity diameter whereby said inlet valve is slidably removable from said first cavity;

piston means carried within said second cylinder and shiftable between extended and retracted positions;

means for operably, detachably coupling said pump head and said manifold casing whereby said pump head can be easily separated from said manifold to expose said inlet valve and said piston means;

means operably coupled with said inlet valve for selectively shifting said inlet valve between said open and closed positions;

means operably coupled with said piston means for selectively shifting said piston means between said extended and retracted positions;

inlet means operably coupled to said third cavity adapted for coupling said third cavity to a source of said fluid to be dispensed;

nozzle means operably coupled to said fourth cavity for selectively dispensing fluid from said fourth cavity;

conduit means operably coupling said third and fourth cavities for fluid communication therebetween; and

control means for synchronizing the operation of said inlet valve shifting means and said piston shifting means such that said inlet valve is positioned in said open positions when said piston is shifted to said retracted position, and said inlet valve is positioned in said closed position when said piston is shifted to said extended Position, whereby said fluid is drawn through said inlet means into said fourth cavity when said piston means is shifted to said retracted position, and said fluid is expelled from said fourth cavity through said nozzle means when said piston means is shifted to said extended position,

said inlet valve and said piston means effectively sealing said third and fourth cavities from said first and second cavities in fluid tight relationship such that said inlet valve shifting means and said piston shifting means are isolated from said dispensed fluid,

said pump head including a detachable first cylinder spacer sleeve, said first cylinder spacer sleeve including structure defining an internal bore comprising a portion of said third cavity, an abutment surface for positionable abutment of said pump head with said manifold, and an abutment shoulder portion slidably received within said first cavity, said inlet valve insertion portion including a stroke limiting member abutable against said sleeve abutment shoulder portion, whereby the stroke of said inlet valve is contained by said first cylinder spacer sleeve when said dispensing system is fully assembled, and said inlet valve insertion portion is slidably removable from said third cavity when said pump head is separated from said manifold.

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**4,610,378**

**CLOSED CONTAINER FOR FOOD POWDERS IN AUTOMATIC BEVERAGE DISTRIBUTING MACHINES**

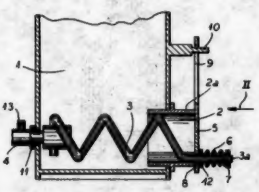
**Lucio Grossi, Via Mazzini, 29, Bergamo, Italy**

**Filed Apr. 30, 1984, Ser. No. 605,491**

**Claims priority, application Italy, May 2, 1983, 21699/83[U]**

**Int. Cl.[4] G01F *11/20***

**U.S. Cl. 222—333** **3 Claims**



1. A container for food powders, in particular for automatic beverage distributing machines, comprising:

a horizontal duct in the lower part of the container;

a delivering mouth formed by an opening at the end of the container;

a revolving delivering and dosing member rotatably supported inside the duct and extending through said mouth;

a motor of the automatic beverage distributing machine to which said revolving delivering and dosing member is removably connected;

a plate closing member supported against said mouth, said plate closing member being traversed by and positively movable from a closing position to an opening position by the delivering and dosing member during its rotational motion; and

a cylindrical pin, the plate closing member being supported,

at a lower part thereof, by the cylindrical pin which constitutes a prolongation of the delivering and dosing member, said cylindrical pin passing through a hole of the plate closing member, a slot being provided in the upper part of the closing member, inside which a fixed guide pin, projecting from the wall of the container, passes.

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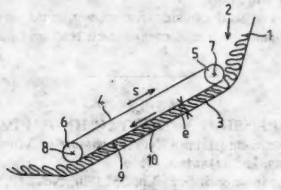
**4,610,379**

## DEVICE FOR HOLDING A TEXTILE ARTICLE IN THE COURSE OF TREATMENT

**Eugéne Voisin, Bouilly, France, assignor to Institut Textile de France, France**

**Filed Mar. 19, 1984, Ser. No. 590,845**
**Claims priority, application France, Mar. 22, 1983, 83 04677**
**Int. Cl.[4] B65H *7/20*; D06B *3/26***
**U.S. Cl. 226—42** **9 Claims**



1. In a device for treating a textile article, said device including a stationary inclined receiving surface having an upper end and a lower end, means for depositing said article onto said upper end in such a way that such article forms folds having a lower part engaging said surface and upper parts projecting away from said surface and such that said folds slide downwardly along said surface under the effect of gravity, and means for drawing off said article from said lower end, the improvement comprising:

an endless belt having an upper section and a lower section;

driving means for driving the belt with said upper section moving upwards and said lower section moving downwards, said lower section being disposed over at least a portion of said surface in substantially parallel relationship with said portion of said surface and at such a distance therefrom as to allow said lower surface of said belt to engage said upper parts of said folds; and

a plurality of rollers which support said belt, one of said rollers being a driving roller, and wherein said driving means comprises a shaft coupled to one of said rollers and motor means for driving a free-wheel coupled to said shaft at a speed which is slightly less than the speed of said shaft when said material is sliding down said surface at its nominal speed under the influence of gravity alone and said material is moving said belt at said nominal speed due to the frictional contact between said article and said belt.

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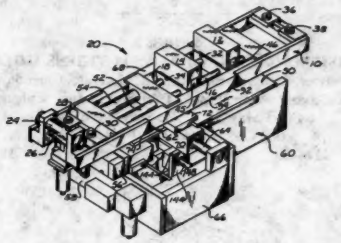
**4,610,380**

## STAGGER FEEDER

**Edwin W. Plumb, Woodbury, Conn., assignor to Pressmate, Inc., Woodbury, Conn.**

**Filed Oct. 26, 1984, Ser. No. 665,041**
**Int. Cl.[4] B65H *20/00***
**U.S. Cl. 226—142** **30 Claims**

1. A feeder for advancing stock in intermittent feed strokes into a downstream work station of a machine such as power press and the like and comprising a frame, a power operated feed head for advancing stock during a feed stroke, a carriage supporting and constraining the feed head for movement parallel to a first axis extending in the feeding direction, the frame supporting and constraining the carriage for movement parallel to a second axis perpendicular to said first axis, a crank



mechanism, and an indexing mechanism for indexing the crank mechanism for controlling feed head movement.

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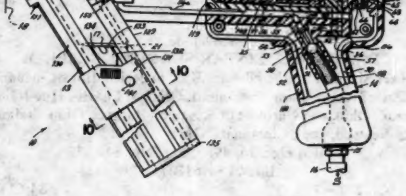
**4,610,381**

## DRYWALL TOOL

**Francis J. Kramer, Edgewood, Ky.; Lester D. Park, and Donald J. Massari, Jr., both of Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio**

**Filed Aug. 30, 1984, Ser. No. 646,419**
**Int. Cl.[4] B25C *1/04, 7/00*; F01L *15/14***
**U.S. Cl. 227—7** **33 Claims**



1. A drywall tool for uniformly dimpling drywall having a facing component and uniformly driving full-headed fasteners into such drywall and supporting wood structure despite varying wood structure characteristics, such that said full heads uniformly lie in a dimpled area of drywall, without tearing any drywall facing component, said tool comprising:

a housing;

a nosepiece slidably mounted on said housing for movement toward said housing;

a magazine means for feeding full-headed fasteners sequentially to a drive position within said nosepiece, said magazine means mounted on said slidable nosepiece;

a driver means mounted to deliver successive limited stroke blows to a fastener, each blow driving a fastener a distance less than its length;

piston means independent of said driver;

means for reciprocating said piston to successively engage and stroke said driver for driving said fastener;

a dimpling surface integral with said nosepiece and movable therewith for creating a dimple in drywall upon final driving of a fastener;

a drive surface on said nosepiece; and

a drive shoulder on said driver means for engaging said drive surface, when said driver means has substantially driven said driver, to produce a dimple in said drywall for receipt of the full head of said fastener;

said limited successive driver strokes providing, during fastener driving and dimple forming, tactile and audible feedback to indicate fastener position and dimple depth with respect to said drywall.

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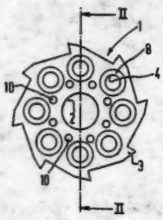
**4,610,382**

## DISK MAGAZINE WITH ANTI-STRESS HOLES

**Jean Ollivier, Valence, and Roland Almeras, Tournon, both of France, assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Filed May 30, 1984, Ser. No. 615,492**
**Int. Cl.[4] B25C *1/18*; F41C *25/00***
**U.S. Cl. 227—9** **10 Claims**




1. In a fastener driving tool powered by blank rimfire cartridges, a metallic loader for carrying the cartridges and provided with closely spaced orifices for receiving the cartridges and holding the cartridges before, during, and after firing in the tool, the loader having stress relief means for preventing the propagation of enough of the mechanical stress created by the firing of one cartridge to the rim of an adjacent cartridge to fire the adjacent cartridge whereby the metallic loader may be compact without having any sympathetic ignitions.

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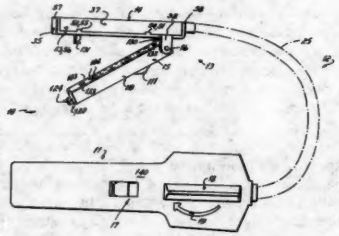
**4,610,383**

## DISPOSABLE LINEAR SURGICAL STAPLER

**Robert G. Rothfuss, Bellevue, Ky.; Federico Bilotti, Madeira, Ohio; Hector Chow, Cincinnati, Ohio; J. Charles Hueil, Loveland, Ohio, and Narinderjit S. Sambi, Batavia, Ohio, assignors to Senmed, Inc., Cincinnati, Ohio**

**Filed Oct. 14, 1983, Ser. No. 542,122**
**Int. Cl.[4] A61B *17/00***
**U.S. Cl. 227—19** **34 Claims**



1. A disposable linear surgical stapler for implanting at least one row of staples in tissue, and including an anvil means for forming and clinching staples, and a staple cartridge means for driving staples across a gap toward said anvil means, said staple cartridge means including:

a cartridge body;

a plurality of paired staple channels in said body;

a plurality of staple drivers comprising staple driver leg members;

a staple driver leg member disposed in operative relation to each pair of staple channels;

a wedge means movable through a path in which said drivers lie for engaging and moving said drivers to sequentially fire said staples;

a flexible cable attached to said cable and means for applying tension to said cable for pulling said wedge through said path and firing said staples; and

wherein each of said drivers is bifurcated and has two offset staple driving leg members, joined at an upper portion thereof, said upper portion defining a tapered cam surface for engagement by said wedge.

2. A disposable linear surgical stapler for implanting and forming at least one row of staples in tissue and including an anvil means for forming and clinching staples, and a staple cartridge means for driving staples therefrom across a gap and toward said anvil means, said anvil means including:

an anvil housing secured against motion with respect to said cartridge means;

an anvil slidably mounted in said housing and defining a plurality of staple pockets for forming and clinching staples in tissue; and

cam means in said housing for moving said anvil with respect to said cartridge means such that said gap is adjustable.

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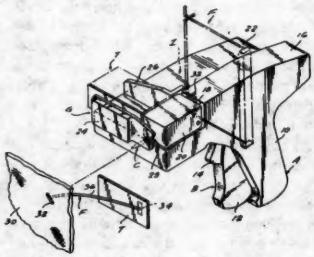
**4,610,384**

## TAG DISPENSING AND ATTACHING APPARATUS

**Daniel Duchin, Long Island, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio**

**Continuation-in-part of Ser. No. 553,080, Nov. 18, 1983. This application Sep. 25, 1984, Ser. No. 654,062**
**Int. Cl.[4] B31F *7/00***
**U.S. Cl. 227—67** **26 Claims**



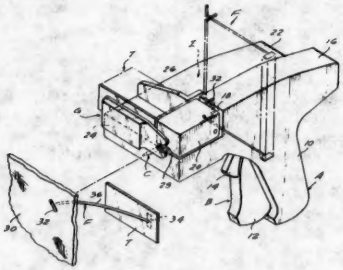
1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the attacher comprising: an attacher body having a hopper adapted to receive a stack of tags and having a manually engageable handle, a needle mounted on the body and having an elongate needle bore and an elongate side opening communicating with the needle bore, means for movably mounting the needle for movement relative to the attacher body between retracted and extended positions, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while its filament section extends through the side opening, a tag feeder engageable with an endmost tag in the hopper for feeding the endmost tag from its position in the stack along a path to an attaching position in alignment with the needle, actuating means including a manually operable actuator disposed at the handle, means including a slide movable in response to the movement of the actuator for moving the push rod, the bar section advancing means and the tag feeder, a cam movable by the slide, and a follower cooperable with the cam for moving the tag feeder in one direction to bring the tag to the attaching position when the actuator is manually operated and for moving the tag feeder in the opposite direction when the actuator is released.

4,610,385

## TAG DISPENSING AND ATTACHING APPARATUS

Daniel Duchin, Wantagh, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 18, 1983, Ser. No. 553,080
Int. Cl.[4] B65C 7/00; A43D 69/00
U.S. Cl. 227—67 26 Claims



1. Tag attaching apparatus comprising a housing, actuating means including first and second actuators, a hollow needle through which a fastener is dispensed, means for movably mounting said needle to said housing for movement between an original position and an extended position along an axis, means for moving a fastener through said needle and means for aligning a tag with said needle, means for moving said needle mounting means and means for operably connecting said actuating means and said tag aligning means, effective, in response to the actuation of said first actuator, to cause said tag aligning means to align a tag with said axis and to move said needle mounting means from said original position to said extended position to cause the needle to pierce the aligned tag and means for causing said fastener moving means to move a fastener through said needle, in response to the actuation of said second actuator.

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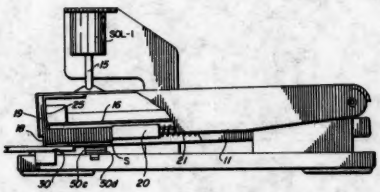
4,610,386

## STAPLER HAVING A VARIABLE STOP MEMBER FOR LIMITING STAPLING STROKE AND STAPLE LEG LENGTH

Carl W. Augostini, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,739
Int. Cl.[4] B25C 5/02, 7/00
U.S. Cl. 227—142 3 Claims



1. In a stapler apparatus of the type having a base member and a staple magazine member movable related toward each other during a stapling operation upon a set of sheets, the magazine member being provided at an end thereof with staple dispensing means, the base member being provided at an end thereof with an anvil member, the anvil member and the staple dispensing means being adapted to cooperate to permit individual ones of the staples to drive against the anvil member, to drive the staple legs through the sheets, and to deform the legs during a stapling operation when the base and magazine member are moved toward each other, the improvement including:

at least one stop member movable into a position between the base and the magazine members and being arranged to limit the relative movement therebetween and control the bending of the legs of the staple.

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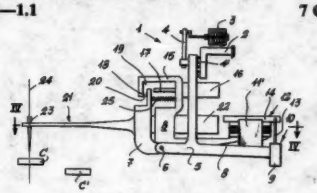
4,610,387

## DEVICE FOR BONDING WIRE LEADS IN ELECTRONIC COMPONENTS

Mario Scavino, Lesmo, Italy, assignor to Robotica S.r.l., Milan, Italy

Filed Dec. 10, 1984, Ser. No. 679,824
Claims priority, application Italy, Dec. 19, 1983, 23884/83[U]
Int. Cl.[4] B23K 1/06
U.S. Cl. 228—1.1 7 Claims



5. A device for bonding wire leads in electronic components comprising in combination: a first frame member (5), a second frame member (7), and a third frame member (8), said second and third frame members (7, 8) being pivotally supported by said first frame member (5) on a common axis (6), locking means (16, 17) supported by the third frame member (8) for temporarily locking the third and the second frame members (7, 8) together, a capillary means (23), an ultrasonic transducer (21), said capillary means (23) being carried by said ultrasonic transducer (21) and said ultrasonic transducer (21) in turn being carried by said second frame member (7), spring means (25) disposed between said second and third frame member (7, 8), a linear motor (12) for pivoting said third frame member (8), a position transducer (10) between said first and third frame members (5, 8) for controlling said linear motor (12), said linear motor (12) comprising at least a pair of permanent magnets (11) carried by said first frame member (5) in mutual parallel relation, and a coil means (14) carried by said third frame member (8) and movable between said pair of permanent magnets (11) so to impart an angular motion to said third frame member (8) when said coil means is energized.

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4,610,388

## CIRCUIT BOARD AND COMPONENT MANIPULATION DEVICE

Thomas A. Koltuniak, Huntington Beach, and William A. Lawrence, Palos Verdes Estates, both of Calif., assignors to Eldon Industries, Inc., Inglewood, Calif.

Filed Feb. 24, 1984, Ser. No. 583,113
Int. Cl.[4] B23K 1/12
U.S. Cl. 228—6.2 19 Claims

1. A circuit board and component manipulation device which comprises:

a housing;

a printed circuit board holder movably mounted on said housing;

gas means for supplying a stream of gas;

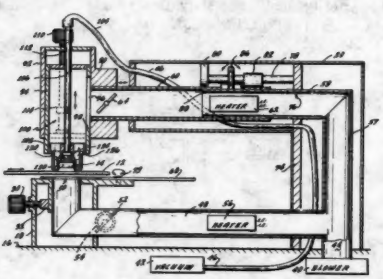
gas duct having ends, one of said ends connected to said gas means whereby gas from said gas means is introduced into said one end and passes through said duct and is discharged from the other of said ends of said gas duct;

gas heating means located in said gas duct for heating the gas in said duct as said gas passes through said duct;

a gas delivery head attaching to the other end of said duct,

said gas delivery head including a gas passageway through said head, said gas passageway in operative association with the other of said ends of said gas duct so as to receive gas passed through said gas duct, the other of said ends of said gas passageway positioned in association with said printed circuit board holder so as to discharge gas towards a selected area of a circuit board positioned in said circuit board holder;

positioning means associated with said circuit board holder and gas delivery head for changing the relative position between said gas delivery head and a printed circuit board held by said printed circuit board holder along the directions of an x-y-z coordinate system;



component vacuum means, said component vacuum means including an vacuum orifice located on said gas delivery head and means for creating a vacuum located on said housing, said vacuum orifice being capable of operatively engaging a component located in association with said gas delivery head and said means for creating a vacuum capable of creating a vacuum at said orifice so as to maintain said component in said association with said gas delivery head.

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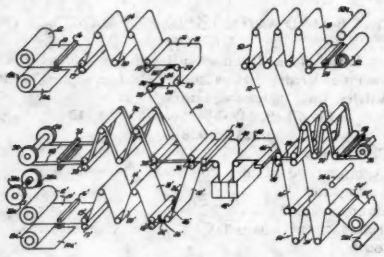
**4,610,389**

## METHOD FOR TREATING A SINGLE SIDE OF A METALLIC SHEET

**Paul C. Perovich, Trenton, Mich., assignor to Comet Research, Inc., Trenton, Mich.**

**Filed Feb. 25, 1985, Ser. No. 704,743**
**Int. Cl.[4] B23K *1/20***
**U.S. Cl. 228—176** **40 Claims**



1. A method for exposing to a treatment operation a single face of a metallic strip, said method comprising applying a first pair of ribbons of molten solder material one ribbon along each edge of a first metallic strip on one face thereof, allowing said first pair of ribbons of solder material to cool sufficiently to solidify, applying a second pair of ribbons of molten material one ribbon along each edge of a second metallic strip on one face thereof, allowing said second pair of ribbons of solder material to cool sufficiently to solidify, joining said first and second metallic strips back-to-back at the edges thereof by re-melting said ribbons of solder material and allowing said solder material to solidify, passing said joined metallic strips through a treatment station for treating the exposed faces of said joined strips, applying heat to said joined metallic strips proximate the edges thereof for melting said solder material, and peeling said metallic strips from each other.

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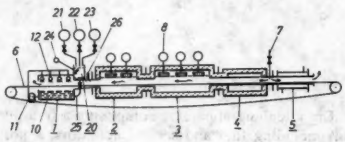
**4,610,390**

## BRAZING METHOD OF ALUMINUM

**Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Japan**

**Filed Jan. 31, 1985, Ser. No. 697,044**
**Int. Cl.[4] B23K *31/02***
**U.S. Cl. 228—207** **1 Claim**



1. In a method of brazing aluminum products as they pass a brazing station, and which comprises continuously and successively performing a flux applying step, a drying step, a temperature elevation step, a brazing step, and a cooling step at said station, the improvement characterized in that an in situ flux producing step is performed substantially simultaneously with the flux applying step, said flux producing step comprising continuously mixing and reacting $Al(OH)_3$ and HF at a temperature between 80° C. and 90° C. to obtain a reaction composition, mixing KOH with the reaction composition until this mixture reaches a pH7, and with or without the addition of water to said mixture, using said mixture in the flux applying step as a flux produced in situ.

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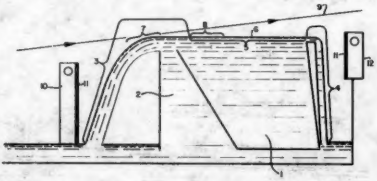
**4,610,391**

## PROCESS FOR WAVE SOLDERING

**Mark S. Nowotarski, Ossining, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Dec. 18, 1984, Ser. No. 682,943**
**Int. Cl.[4] B23K *1/08, 31/02***
**U.S. Cl. 228—219** **7 Claims**



1. In a process for wave soldering a work-piece in an atmosphere consisting essentially of air wherein (i) there is a first portion of the solder wave in which fluid motion can be observed, said first portion including an active dross forming area, and (ii) there is a second portion of the solder wave, which is the last portion of the solder wave with which the work-piece comes into contact, the improvement comprising

(a) subject to step (b), replacing the atmosphere in contact with at least about 50 percent of the surface of the active dross forming area with an inert gas; and

(b) maintaining the atmosphere in contact with the surface of

the second portion as an oxidizing gas regardless of whether the first and second portions overlap.

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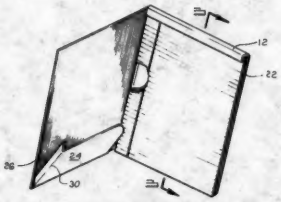
4,610,392

## PORTFOLIO ADAPTED FOR INCORPORATION OF A PAPER PAD

Adelino B. DaRosa, Springfield, Mass., assignor to Ampad Corporation, Holyoke, Mass.

Filed Dec. 19, 1984, Ser. No. 683,345
Int. Cl.[4] B65D *37/00*
U.S. Cl. 229—1.5 R 5 Claims




1. A portfolio comprising:
a front panel, said front panel having a top end and a bottom end;
a rear panel hingedly connected to said front panel along a first center fold line, said rear panel having a top end and a bottom end;
an extension flap attached to the top end of said rear panel along a pair of fold lines;
an intermediate panel defined between said pair of fold lines;
an end flap hingedly connected to said extension flap along a second fold line, said end flap being oppositely disposed on said extension flap from said rear panel;
a paper pad having a bound end, said bound end of said paper pad being affixed only to said end flap thereby permitting said paper pad to be pivotally displaced from said portfolio.

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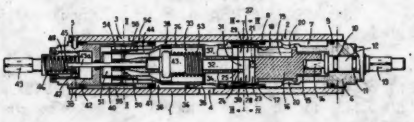
4,610,393

## COLD AND HOT WATER MIXER TAP WITH CERAMIC PLATES CONTROLLED BY MEANS OF A THERMOSTAT

Jean-Jacques Rodriguez, Douvaine, France, assignor to Kugler, Fonderie et Robinetterie S.A., Geneva, Switzerland

Filed Feb. 5, 1985, Ser. No. 698,439
Claims priority, application Switzerland, Mar. 16, 1984, 1347/84
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.15 14 Claims



1. Mixer tap comprising within a body presenting cold and hot water inlet openings and an outlet opening for the mixed water, a device for regulating the flow rate of at least one of the inlet water and of the mixture of water, as well as a regulating device of the temperature, characterized by the fact that the device for regulating the flow rate comprises an obturator with only one pair of ceramic plates displaceable in rotation the one with respect to the other, the ceramic plates controlling the flow rate of and contacting simultaneously only one stream of inlet water and the outgoing mixture of water.

4,610,394

## MOLDED DISPENSING CONTAINER

John D. Bryson, Milwaukee, Wis., assignor to Vaportek, Inc., Milwaukee, Wis.

Filed Mar. 19, 1981, Ser. No. 245,396
Int. Cl.[4] A61L *9/12*
U.S. Cl. 239—57 13 Claims

1. A container fabricated of plastic and including a sidewall defining a hollow interior and having spaced end margins defining sidewall ends, one of said end margins including an inwardly extending flange, said sidewall also having a side portion extending intermediate said end margins and including first and second sub-sections which have respective outer edges including interfitting edge means defining a substantially air-tight side seam, a closure member extending in a telescopic relation over one of said sidewall end margins and closing the adjacent one of said sidewall ends, said closure member being rotatable relative to said sidewall between arcuately spaced first and second positions, including an end wall located adjacent said flange, and a ring structure extending inwardly of said container from said end wall and from adjacent said flange valve means including respective apertures in said one end margin and in said closure member, said apertures being substantially in register, and thereby open, when said closure member is in said first position and said apertures being substantially out of register, and thereby closed, when said closure member is in said second position, interfitting means on said one end margin and on said closure member for permitting relative rotation therebetween, for preventing disassembly therebetween, and for preventing disassembly of said edge means, and an end member extending in telescopic relation to the other of said end margins of said sidewall and closing the other of said sidewall ends.

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4,610,395

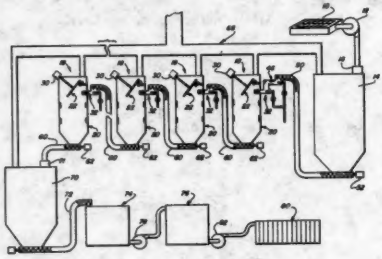
## PROCESS FOR PRODUCING PARTICULATE PIGMENT HAVING IMPROVED TINCTORIAL CHARACTERISTICS

James A. Ford, 521 Morris La., Hinsdale, Ill. 60521

Filed Feb. 27, 1984, Ser. No. 583,660
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—5 27 Claims

1. A process for treating particulate pigment for enhancing the tinctorial characteristics thereof for subsequent production of printing media, comprising the steps of:
providing a containment;
providing a supply of said particulate pigment;
entraining said particulate pigment in a gaseous stream;
directing said gaseous stream and the pigment entrained therein in a substantially linear path against impact means mounted for movement within said containment, whereby said particulate pigment impacts said impact means for reduction in the particle size of said particulate pigment; and

moving said impact means for periodically cleaning an impact surface thereof with cleaning means positioned



within said containment to avoid build-up of particulate pigment thereon.

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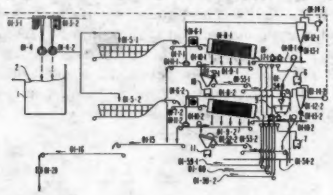
**4,610,396**

**PROCESS FOR THE TREATMENT OF MUNICIPAL REFUSE AND PLANT FOR ITS EXECUTION**

**Enrique Carbonell Serra, Ronda General Mitre, 63, Barcelona, Spain, and Daniel Boudry, 66, chemin de Conches, 1231 Conches, Switzerland**

**Filed Jan. 4, 1984, Ser. No. 568,119**
**Claims priority, application Spain, Jan. 10, 1983, 518876**
**Int. Cl.⁴ B02C *21/00***
**U.S. Cl. 241—24** **11 Claims**



1. A process for treatment in a plant of municipal refuse as collected in sacks, which permits complete separation of the refuse into fractions of combustibles, vegetable matter, hard plastics, PVC, glass containers, ferrous scrap and inert substances, and comprising the following steps starting from a receiving pit for the refuse:

(a) tearing the sacks open;

(b) mixing the shredded municipal refuse;

(c) charging a treatment line wherein the refuse undergoes primary separation to produce separated products including combustible and organic fractions;

(d) collecting some of the separated products as directly reuseable products; and

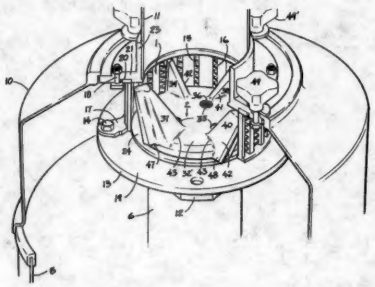
(e) routing said combustible fraction and said organic fraction to lines for treatment, said treatment comprising separating a magnetic fraction from each of the combustible fraction and the organic fraction and separating the resulting magnetic fractions into two main components comprising cans and bottle caps.

**4,610,397**

**COMMINUTING EQUIPMENT**

**Robert R. Fischer, Michigan City, and Joe R. Urschel, Valparaiso, both of Ind., assignors to Urschel Laboratories Incorporated, Valparaiso, Ind.**

**Filed Oct. 27, 1983, Ser. No. 546,182**
**Int. Cl.⁴ B02C *18/08***
**U.S. Cl. 241—86** **6 Claims**



1. An apparatus for comminuting a product comprising:

(a) a bottom support;

(b) a tubular cylinder, having an interior wall, mounted on the bottom support, the interior wall of the cylinder being provided with a plurality of transverse passages and a plurality of corresponding cutting edges disposed adjacent the passages;

(c) an impeller supported for rotation about an axis within the cylinder;

(d) the impeller including a base having a periphery and an even number of blades supported on and extending upwardly from the base and disposed in a circular configuration, half of the total number of blades sloping forwardly from the base towards the direction of rotation and the remaining half of the total number of blades sloping rearwardly from the base away from the direction of rotation with respect to the impeller axis of rotation, each forwardly sloping blade being positioned between two rearwardly sloping blades; and

(e) a top end of each forwardly sloping blade extending beyond a top end of each rearwardly sloping blade and a bottom end of each rearwardly sloping blade extending beyond a bottom end of each forwardly sloping blade for defining an undulating path along which the product is caused to flow during rotation of the impeller.

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**4,610,398**

**CHEESE SHREDDING MACHINE AND BLADE THEREFOR**

**Peter G. Palazzolo, 3518 Brotherton Rd., Cincinnati, Ohio 45209**

**Filed Jan. 25, 1985, Ser. No. 695,202**
**Int. Cl.⁴ B02C *18/04***
**U.S. Cl. 241—92** **7 Claims**

1. A machine, for shredding a block of cheese-like material, comprising:

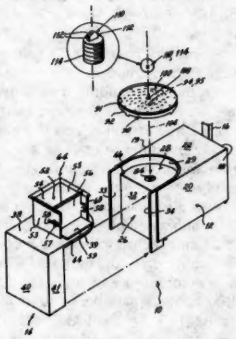
rotatable hub means defining a horizontal reference and having a central axis of rotation;

a cheese shredder blade having a substantially horizontal surface defining a plane, said blade being disposed above and mounted to said rotatable hub means for rotation therewith;

multi-faceted central cutting means for shredding a portion of a block of cheese-like material across and through said axis of rotation, said cutting means being removably received in said rotatable hub means and projecting up-

wardly through an aperture in said blade and away from said rotatable hub means along the axis of rotation, said cutting means having at least a first cutting edge and a second cutting edge, said first cutting edge being spaced from said axis of rotation and extending vertically upwardly from said plane to a first terminus spaced above said plane, said second cutting edge being spaced above said plane and extending upwardly from said first terminus to a second terminus at said axis of rotation, said second terminus being spaced above said first terminus and said second terminus being spaced from said plane by a vertical distance that is greater than a vertical distance from said plane to any other point on said cutting means;

a plurality of apertured outer cutting teeth formed in said blade and projecting upwardly from said plane, each tooth presenting a single cutting edge, at least some of said teeth being in near proximity to and surrounding said central cutting means, said teeth being formed in a series of spirals spiralling outwardly from near said central cutting means, said teeth being adapted to shred another portion of the block of cheese-like material, said central cutting means and said outer cutting teeth defining a circular shredding



surface without a dead zone, which is where shredding is not being effected, when said rotatable hub means is rotated;

hopper means disposed above said blade for presenting the block of cheese-like material to said circular shredding surface teeth and said central cutting means;

cheese ramming means movable between a first position spaced above said hopper means and a second position spaced adjacent said shredding surface for pushing the block of cheese-like material against said shredding surface;

said hub means and said blade having respective outer edges, at least one of said outer edges defining a periphery of said hub means and blade, the machine further including housing means surrounding said periphery of said hub means and blade; and

motor means coupled to said hub means for rotating said hub means, blade, and central cutting means; said circular shredding surface without a dead zone cooperating to shred cheese without materially slowing rotation of said hub means, said blade, and central cutting means in order to reduce the likelihood of premature failure of said motor means.

**4,610,399**

## MIXING PARTICULATE MATERIALS

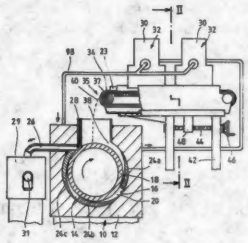
**Erich Weichenrieder, Egling-Neukolbing, Fed. Rep. of Germany, assignor to Recycloplast AG, Egling-Neukolbing, Fed. Rep. of Germany**

**Filed Jan. 17, 1985, Ser. No. 692,116**

**Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401758; Jan. 19, 1984, 3401774; Jan. 19, 1984, 3401789**

**Int. Cl.[4] B02C *4/00***

**U.S. Cl. 241—101 B** **23 Claims**



**1**. A method of mixing particulate materials with a given mixing ratio, said method forming part of a process requiring said materials, comprising the steps of:

providing particulate materials to at least two metering units,

metering said materials separately each in said respective metering unit, said metering unit operating at least substantially continuously,

crushing said particulate materials in said metering units,

distributing said materials by free fall onto a horizontal conveyor belt with a planar surface with a distribution of said materials over said belt,

matching the distribution rate of said materials with the speed of said conveyor belt such that said given desired mixing ratio is obtained, and

supplying said materials in a further free fall to a further processing zone as part of said process.

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**4,610,400**

## DEVICE AT REFINERS FOR LIGNOCELLULOSE-CONTAINING MATERIAL

**Axel H. Sjöbom, Bellevue, Wash., assignor to Sunds Defibrator Aktiebolag, Sundsvall, Sweden**

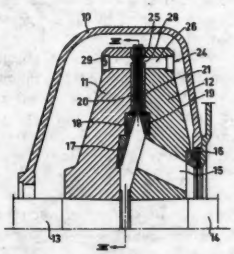
**PCT No. PCT/SE84/00119, § 371 Date Nov. 19, 1984, § 102(e) Date Nov. 19, 1984, PCT Pub. No. WO84/04057, PCT Pub. Date Oct. 25, 1984**

**PCT Filed Apr. 3, 1984, Ser. No. 681,869**

**Claims priority, application Sweden, Apr. 12, 1983, 8302013**

**Int. Cl.[4] B02C *7/12***

**U.S. Cl. 241—261.2** **5 Claims**



**1**. A device for refining lignocellulose-containing material

comprising a pair of carriers each of which is provided with refining members connected thereto, the refining members defining refining segments positioned in a ring about the carrier, rear sides of the refining segments and the carriers having facing surfaces provided with keyingly interengaging substantially radial cams and grooves, wherein the refiner segments are individually locked on the carriers by a separate movable locking rod member receivable in a bore defined in the carriers, the refiner segments provided with a recess on the rear sides substantially concentric with the bore, the rod member movable in said bore and engageable with the recess so as to lock the segments to the carriers.

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**4,610,401**

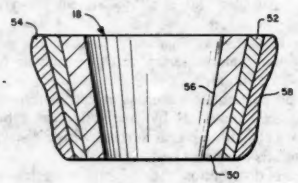
## TRIMETAL PULVERIZER ROLL

**Theodore V. Maliszewski, North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Continuation of Ser. No. 446,850, Dec. 6, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 764,802**

**Int. Cl.[4] B02C** *4/30*

**U.S. Cl. 241—294** **4 Claims**




1. A pulverizer roll for use in a bowl mill for purposes of effecting the pulverization of material therewithin comprising:

a. a first portion made of gray iron cast as a complete element having a substantially circular outer surface, said first portion being of uniform thickness and having a through passage formed therein suitably dimensioned so as to be capable of receiving therewithin a member operative for effecting the mounting thereon of the pulverizer roll in supported relation thereto;

b. a second portion made of a medium wear-resistant material cast as a complete element having a substantially circular inner surface and a substantially circular outer surface, said second portion being of a uniform thickness and being superimposed on said first portion in layered relation thereto with said inner surface of said second portion positioned so as to be in engagement with said outer surface of said first portion;

c. a bonding agent deposited on said outer surface of said first portion, said bonding agent being operative to effect the adherence of said outer surface of said first portion to said inner surface of said second portion;

d. a third portion made of a highly abrasive resistant material deposited as a weld overlay on said outer surface of said second portion, said third portion having an external surface specifically configured so as to replicate the predicted wear pattern to which the outer surface of the pulverizer roll will be subjected when the pulverizer roll is placed in operation; and

e. means located on said outer surface of said second portion operative to provide a visual indication of when said third portion has worn through.

**4,610,402**

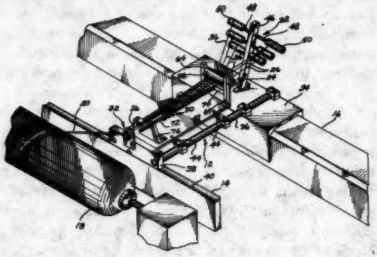
## FILAMENT WINDING FEED SYSTEM

**Darrell H. Corbett, Kent, and C. Robert Speelmon, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 26, 1984, Ser. No. 655,041**

**Int. Cl.[4] B65H** *57/06, 57/16, 57/24, 57/28*

**U.S. Cl. 242—7.22** **11 Claims**



1. A filament winding feed system for controlling the movement of strands of preimpregnated fibrous composite material from a supply source to a mandrel, the system comprising:

(a) strand collimation means for collimating a plurality of strands of fibrous material drawn from the supply source; and

(b) strand convergence means for focusing the strands into a single band for winding about the mandrel, the strand convergence means including a feed eye through which the strands are drawn, the feed eye including a mounting member and a hub assembly that is rotatably mounted to the mounting member, the feed eye also including a curved rotatable contact part configured to fit within the hub assembly and mounted to be freely rotatable therein, the feed eye also including fastener means extending through the hub assembly and configured to engage the contact part and securely retain the contact part within the hub assembly, the contact part having a contact surface that is configured and arranged for contacting the strands, the contact part being rotatable in response to forces applied to it by the band as the band changes its position relative to the mandrel during the winding process.

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**4,610,403**

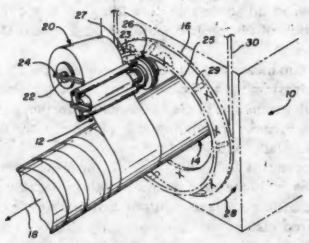
## PIPE TAPE TENSIONER

**Robert G. Goekler, Owasso, and Gary N. King, Tulsa, both of Okla., assignors to CRC Pipeline International, Inc., Fort Worth, Tex.**

**Filed Jan. 30, 1984, Ser. No. 575,442**

**Int. Cl.[4] B65H** *81/08, 23/10*

**U.S. Cl. 242—7.23** **8 Claims**



1. A device for extering a constant tension on a material for

wrapping about pipe, the material being provided from a material source, means defining a support for mounting the material source, and means for rotating said support and material source about the circumference of the pipe and moving the material source and pipe relative to each other along the length of the pipe so that the material is applied to the pipe at an angle oblique to the length of the pipe, the material source being mounted on the support so that the material is supplied from the material source at the oblique angle to the length of the pipe; comprising:

a base having an aperture formed therin, the walls forming said aperture being splined;

means for mounting said base on the support;

a primary roller rotatably mounted on said base, said primary roller having a hub extending into the aperture of said base, said hub being splined, the axis of rotation of the primary roller extending at the oblique angle relative the length of the pipe;

at least one first clutch disk splined to said base within said aperture;

at least one second clutch disk splined to said hub within said aperture;

an adjusting nut threadedly received in the aperture on one side of said first and second clutch disks; and

spring means effective on the side of said first and second clutch disks opposite said adjusting nut for urging said clutch disks into contact to generate frictional resistance to rotation of the primary roller relative to the base, movement of the adjusting nut varying the force exerted by said spring means on said clutch disks to vary the frictional resistance to rotation to vary the tension of the material applied on the pipe, the positioning of the rotational axis of the primary roller at the oblique angle ensuring that the tension exerted on the material by the primary roller is uniform across the width of the material.

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**4,610,404**

## ROBOT DEVICE FOR LOADING AND UNLOADING SPOOLS IN WIRE WINDING MACHINES

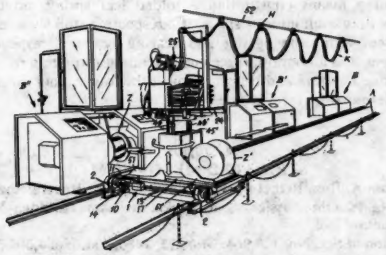
**Angelo Maccaferri, Bologna, Italy, assignor to S.A.M.P. S.p.A. Meccanica di Precisione, Bologna, Italy**

**Filed Nov. 19, 1984, Ser. No. 673,062**

**Claims priority, application Italy, Nov. 18, 1983, 12678 A/83**

**Int. Cl.[4] B65H** *54/00, 54/02*

**U.S. Cl. 242—25 R** **11 Claims**



1. A robot device for loading empty spools (Z') and unloading filled spools (Z) respectively into and from wire winding machines (B, B', B'') aligned in a single file on one side of a path (A), comprising a transport carriage (1) movable along said path (A) and carrying a vertical supporting structure (23) onto which are movably mounted at least two brackets (51, 51') for supporting said empty and filled spools (Z', Z), said brackets (51, 51') extending in directions opposite to one another, lifting and lowering devices (46, 46') and rotating devices (31, 32, 33) being provided to promote vertical movement and rotation of said brackets (51, 51') around said vertical supporting structure (23), wherein

(a) the winding axes of said wire winding machines (B, B', B''), and consequently the axes of said spools housed in said wire winding machines, are substantially parallel to the longitudinal axis of said path (A) along which said carriage (1) moves, at least in a section of said path (A) facing said wire winding machine arranged at its side;

(b) transverse displacement means (17) are provided on said carriage (1) for moving said vertical supporting structure (23) in a direction which is substantially perpendicular to the longitudinal axis of said path (A) and to the winding axis of said spool (Z) housed in a winding machine (B), whereby unloading of said filled spool (Z) from said winding machine onto a said bracket (51) and loading of said empty spool (Z') from a said bracket into said winding machine are affected by moving said spools (Z, Z') in directions which are perpendicular to said winding axes of said spools;

(c) each bracket (51, 51') has, on its longitudinal sides which are perpendicular to said winding axes of said spools (Z, Z'), side engagement members (151, 151') adapted to engage at least one flange of said spool, said engagement taking place upon controlled movement along said path (A) of said carriage (1) when said brackets are in their lifted position and introduced in said wire winding machine, whereby controlled movement of said carriage (1) in one direction causes freeing of said filled spool (Z) from a center or tailstock (P) of said wire winding machine for unloading of said filled spool onto said bracket, while controlled movement of said carriage (1) in an opposite direction causes engagement of said empty spool (Z') with said center or tailstock (P) of said wire winding machine for loading of said empty spool on said winding machine.

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**4,610,405**

## TAKE-UP TUBE SUPPLY SYSTEM IN WINDER

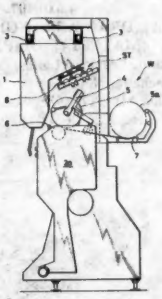
**Shinji Noshi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Sep. 7, 1984, Ser. No. 648,646**

**Claims priority, application Japan, Sep. 7, 1983, 58-165595**

**Int. Cl.[4] B65H** *67/04, 54/26*

**U.S. Cl. 242—35.5 A** **15 Claims**



1. A take-up tube supply system for use in an automatic winder having a plurality of winding sections, comprising:

a truck attached to said winder, said truck being capable of transit through more than one of said winding sections,

a plurality of take-up tube stockers, each of said stockers being associated with one of said winding sections, each of said stockers being capable of retaining one or more take-up tubes,

means for engaging said truck and said stocker when said truck enters said winding section associated with said stocker;

means for disengaging said truck and said stocker when said

truck exits said winding section associated with said stocker;

wherein said truck is engaged with said stocker associated with said winding section when said truck is in transit through said winding section.

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**4,610,406**

**BOBBIN SUPPLYING SYSTEM**

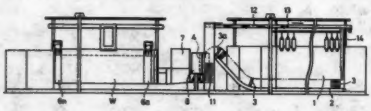
**Isamu Matsui, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Aug. 28, 1984, Ser. No. 645,177**

**Claims priority, application Japan, Sep. 2, 1983, 58-162333**

**Int. Cl.[4] B65H** *67/06*

**U.S. Cl. 242—35.5 A** **10 Claims**



1. A bobbin supplying system comprising:

a winder;

a spinning bobbin supplying station;

a plurality of carrier members configured to support said bobbins;

a carrier transporting path provided between said winder and said spinning bobbin supplying station for guiding and conveying said carrier members between said winder and said spinning bobbin supplying station;

a first sensor for generating a first signal indicative of the presence of a carrier member ato a predetermined location on said carrier transporting path;

a second sensor for generating a second signal indicative of the absence of a bobbin on said carrier member located at said predetermined location;

a delivery means responsive to said first and second signals for delivering a spinning bobbin from said spinning bobbin supplying station to said carrier member lcoated at said predetermined location.

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**4,610,407**

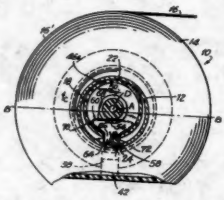
**FRICTIONAL DRAG ARRANGEMENT FOR SHEET MATERIAL DISPENSER**

**Albert Stubbmann, Franklin Lakes, N.J., assignor to Clik-Cut, Inc., New Rochelle, N.Y.**

**Filed May 17, 1985, Ser. No. 735,456**

**Int. Cl.[4] B65H** *16/06, 23/08*

**U.S. Cl. 242—55.2** **1 Claim**



1. In a sheet material plastic film dispenser of the type wherein a user, for each use, manually grasps transversely spaced-apart regions of a free leading end portion of a limp, non-self-supportable, thin, broad sheet film material having a transverse width at least equal to ten inches, and withdraws a desired length of the film material to be dispensed under tension to an elevated position above a planar cutting blade, and thereupon lowers the tensioned withdrawn film material onto the cutting blade in a plane generally perpendicular to that of the cutting blade to effect cutting of the lowered film material across its entire transverse width, a frictional drag arrangement comprising:

(a) a support;

(b) a cylindrical tubular core extending along a longitudinal axis of symmetry and having a generally horizontally-extending median plane extending through the symmetry axis, said core having a pair of open axial end regions, each having an upper inner circumferential surface above the median plane and a lower inner circumferential surface below the median plane;

(c) a coiled supply of the sheet film material wound about the symmetry axis on the core to turn the same during each withdrawal of the tensioned sheet film material;

(d) bearing means stationarily mounted on the support and having a pair of discrete stub shafts, each having an interior horizontally-extending pin and a circumferential wall surrounding the pin and bounding an interior space therewith, each circumferential wall having an aperture, each stub shaft being freely insertable into a respective end region of the core and slidably supporting the upper inner circumferential surface of the inserted and sheet-material-laden core for turning movement of the latter about the symmetry axis during each withdrawal of the sheet material, said upper inner circumferential surfaces slidably and frictionally engaging the stationary stub shafts and exerting a first drag force on each trailing end portion of the withdrawn sheet film material to tauten the same, said first drag force having a magnitude which decreases in value as more of the sheet film material is spent and removed from the core, said lower inner circumferential surfaces being spaced at a clearance from the stationary stub shafts; and

(e) drag means spanning the clearance between the stationary stub shafts and the lower inner circumferential surfaces of the core, and operative for constantly urging the stub shafts into engagement with the upper inner circumferential surfaces of the core to enhance the first drag force, and also engaging the lower inner circumferential surfaces of the core for exerting a second drag force on each trailing end portion of the withdrawn sheet film material to tauten the same, said second drag force having a magnitude sufficient to ensure tautening of each successively withdrawn sheet material even when the sheet film material is almost completely removed from the core, said drag means constituting a folded leaf spring mounted within each interior space of a respective stub shaft, each leaf spring having one end bearing against a respective pin, and an opposite free end extending through a respective aperture and bearing against the lower inner circumferential surfaces of the core.

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**4,610,408**

**STRIP FEED MECHANISM**

**William A. Box, Bethel Park, Pa., and John W. Rogers, Shaker Heights, Ohio, assignors to Coiled Investments, Inc., Wilmington, Del.**

**Division of Ser. No. 129,964, Mar. 13, 1980, Pat. No. 4,304,370. This application Apr. 16, 1981, Ser. No. 254,577**

**Int. Cl.[4] B21C** *47/16*

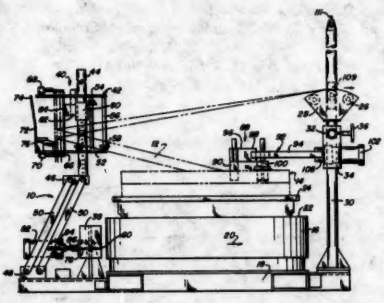
**U.S. Cl. 242—78.6** **3 Claims**

1. Apparatus for detaching strip material from a wound coil construct of sheet metal web material having a plurality of laterally spaced, longitudinally extending parting lines defining a plurality of laterally spaced coil strips, said strips being frangibly interconnected in side-by-side relation by intermittently spaced tabs bridging the parting line between adjacent strips, comprising:

(a) a rotary turntable for supporting a construct in substantial coaxial relation therewith;

(b) means for rotating said turntable in a direction to effect unwinding of a strip from said construct;

(c) a stationary post spaced from said turntable and extending substantially parallel to the axis thereof;
(d) arm means pivotally connected to said post;
(e) said arm means attaching a finger-like body for interposition between the outermost wrap of the construct strip to be detached and the next adjacent wrap, said body extending transversely of said strip to be detached and having its leading end positioned short of the affected parting line; and
(f) a snubber roll rotatably attached on said arm means in leading relation to said body for bearing against the exterior surface of said strip.



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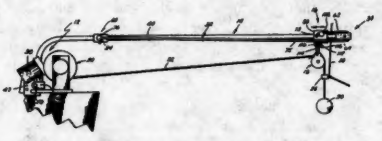
**4,610,409**

## TIP UP RIGGER WITH TROLLEY SUBASSEMBLY

**John E. Emory, Jr., Traverse City, Mich., assignor to Big Jon, Inc., Traverse City, Mich.**

**Filed Nov. 26, 1984, Ser. No. 674,931**
**Int. Cl.[4] A01K *97/10*; B66D *3/04***
**U.S. Cl. 242—106** **21 Claims**



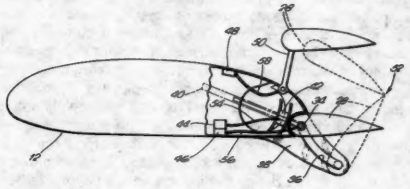
1. A rigger subassembly comprising:
a base adapted to be secured to a boat;
an elongated arm connected to and extending outwardly from said base, said arm having a free end;
a trolley slidably mounted on said arm for movement between a position adjacent said base and a position adjacent said free end;
a stop on said arm on limit movement of said trolley towards said free end;
a downrigger line pulley secured to said trolley for movement on said arm;
biasing means engaging said trolley for biasing said trolley towards said free end;
pivot means between said arm and said base for pivoting said arm to said base; and
latch means on said base for latching said arm in a tip up position generally perpendicular to said base,

**4,610,410**

## COMPOUND HELICOPTER AND POWERPLANT THEREFOR

**John D. Sibley, Watford, England, assignor to Rolls-Royce Limited, London, England**

**Filed Jul. 20, 1984, Ser. No. 632,825**
**Claims priority, application United Kingdom, Jul. 22, 1983, 8319783**
**Int. Cl.[4] B64C *21/04*, *27/26***
**U.S. Cl. 244—12.5** **8 Claims**



1. An aircraft provided with a wing which incorporates a lift augmentation device comprising a pair of spaced flaps at a trailing edge of the wing, a duct which terminates in one or more fluid discharge openings in a surface of the wing, and means for supplying compressed air to the duct, said one or more openings being positioned relative to the flaps so that air issuing from the one or more openings induces an air flow in the space between the flaps and thereby generates lift by causing air to flow over lift producing surfaces of the wing and flaps, said flaps being an upper flap and a lower flap, said lower flap constituting an elevator of the wing, said upper and lower flaps being movable to a position where they cooperate with each other to obturate the flow of air in the space between the flaps and provide a means for decelerating the forward speed of the aircraft, the lower flap being mounted on a pivot movable relative to the wing along a path which causes an upstream edge of the lower flap to move in a direction away from the wing, actuation means being provided for pivoting the lower flap and moving the pivot along the path thereby causing the upstream edge of the lower flap to move into the ambient air flowing under the wing.

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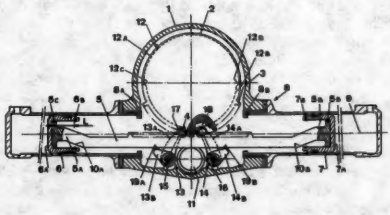
**4,610,411**

## STEERABLE AIRCRAFT LANDING GEAR HAVING AUTOMATIC SAFETY DECLUTCHING AND ENCLUTCHING

**Jacques Veaux, Chatillon-Sous-Bagneux; Jean-Michel Dubos, and Pierre Woerner, both of Fontenay-Aux-Roses, all of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France**

**Filed Jul. 18, 1985, Ser. No. 756,120**
**Claims priority, application France, Jul. 30, 1984, 84 12046**
**Int. Cl.[4] B64C *25/50***
**U.S. Cl. 244—50** **10 Claims**



1. Aircraft landing gear including a wheel bearing shaft, a

toothed sector fixed to rotate with said shaft, and a hydraulic actuator disposed transversely to the shaft in the plane of the toothed sector, said actuator including two opposing first pistons interconnected by a piston rod, a rack fitted to said rod in its longitudinally central portion, said rack meshing with the toothed sector to displace said sector between two extreme mesh points corresponding to the angular swivelling limits of the shaft bearing wheel under actuator control, said piston rod including two opposing faces, which faces are longitudinally spaced thereon, and the piston rod being assembled with two second pistons which slide over a sliding stroke of length L, said first and second pistons further having beyond said end mesh points, an additional stroke of length $L_1$ chosen in correspondence with said sliding stroke, the shaft being provided with a cam having an active surface circumferentially outside the extent of the toothed sector, and two locking means movably mounted between the cam and the piston rod, each locking means having a first branch whose end operatively engages with the cam, and a second branch which constitutes a bolt actively engageable with a corresponding stop face of the piston rod when said piston rod has been displaced along the sliding stroke L and the additional stroke $L_1$, beyond either of said end mesh points with the toothed sector, by manually maneuvering the wheel bearing shaft until said piston rod encounters an end of stroke abutment.

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**4,610,412**

**FASCIA-GUTTER BRACKET ASSEMBLY**

**John M. Holden, Brisbane, Australia, assignor to Speedifix Building Components Pty. Ltd., Queensland, Australia**

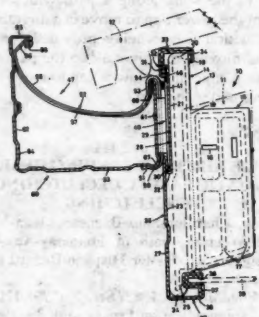
**PCT No. PCT/AU83/00189, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02552, PCT Pub. Date Jul. 5, 1984**

**PCT Filed Dec. 20, 1983, Ser. No. 642,681**

**Claims priority, application Australia, Dec. 20, 1982, PF7334**

**Int. Cl.[4] E04D *13/06***

**U.S. Cl. 248—48.2** **7 Claims**



1. A fascia-gutter system including:

a mounting bracket having a backing plate connectable to a fascia and a pair of opposed flanges spaced from the backing plate;

a gutter bracket having a mounting plate engageable with the backing plate and flanges of the mounting bracket and a support arm extending forwardly from the mounting plate and engageable with a portion of a front wall of a gutter to support the gutter;

releasably engageable formations provided on said flanges of the mounting bracket and on the mounting plate of the gutter bracket to enable the gutter to be supported in a range of height adjustments relative to the fascia, and

a fascia having a fascia panel with a tunnel-like formation having a face panel spaced rearwardly of the fascia panel and interconnected to the fascia panel by upper and lower opposed channel-like formations, and so arranged that the backing plate of the mounting bracket is slidably or releasably engageable in the tunnel-like formation.

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**4,610,413**

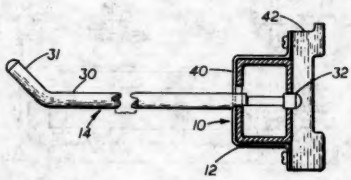
**PEGBAR DISPLAY DEVICE**

**Gerald D. Pedersen, Stanton Township, Goodhue County, Minn., assignor to Cannon Equipment Company, Cannon Falls, Minn.**

**Filed Jul. 15, 1983, Ser. No. 514,070**

**Int. Cl.[4] E04G *3/00***

**U.S. Cl. 248—220.3** **13 Claims**




1. A pegbar for presenting goods, said pegbar comprising:

(a) a peg support having a front keyhole with a non-movable and fixed full width upward facing flat bottom and a fixed back bore, said keyhole and said back bore being aligned with each other with the keyhole being spaced forward of the back bore, for rotatably accepting therein a peg toe inserted firstly through the keyhole and then into the back bore, said keyhole having a height greater than its width;

(b) a round wire peg easily insertable in and removable from the keyhole and the back bore of the support, said peg being relatively rotatable in the keyhole and back bore and having

(1) a forward extending body for support thereon of goods to be presented by the pegbar,

(2) a round distal toe forming the back end of the peg,

(3) a bottom indexing flat spaced forward of and discrete from the toe and facing downward on the peg, said flat having a width at least equal to a majority of the width of the peg body and the keyhole bottom, said index flat being engagable directly against the keyhole bottom for and so that the peg is rotatably indexed and fixed with respect to the support by the weight of the body and the weight of any goods on the body forcing the indexing flat downward and onto and against the keyhole bottom.

(4) a forward facing lateral abutment forward of the toe and extending transversely from the peg body and parallel to and above and immediately rearward of the indexing flat for abuttingly engaging the support immediately to the rear and to the side of the keyhole only when the flat is parallel to the bottom, the width across the peg at the abutment being less than said keyhole height and greater than said keyhole width and greater than either the width or the height of the back bore, so that the abutment can not be pushed completely through or withdrawn from the support when the indexing flat is on the keyhole flat bottom; and

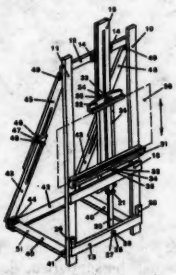
(c) in which said abutment normally retains the peg in the support by said abutting engagement, said peg and said abutment being rotatable about 90 degrees in the peg support like a key, for easy and selective withdrawal or insertion of the peg from or into the keyhole and back bore of the support and for locking and unlocking the peg into and from the support without requiring excessive lifting of the peg body.

4,610,414

## EASEL

Paul E. Schuck, 8001 E. Broadway #518, Mesa, Ariz. 85208

Filed Apr. 2, 1984, Ser. No. 595,594
Int. Cl.[4] A47B 97/08
U.S. Cl. 248—449 1 Claim



1. An easel for supporting a picture, or workpiece, facewise to a person positioned in front of it comprising,

a. an upright frame or standard,

b. a rear leg assembly on said standard for supporting the latter in an upright position,

c. said leg assembly including a rearwardly extending base frame hingedly connected at one of its ends to said standard and hingedly connected at its other end to one end of a pair of upright segments,

d. the other end of each said pair of upright segments being connected with one end of a second pair of upright segments in a releasable slidable joint,

e. said second pair of upright segments having their other ends hingedly connected to said standard above the hinged connections of said rearward extended base frame with the standard whereby said two pair of leg segments and base frame can be folded up against the back of said standard by releasing said slidable joint between said pair of upright segments and pivoting the rearward extending base frame and said second pair of upright segments toward the standard,

f. a work holder rack comprising a slot and a lower cross bar movable along said standard means to a selected working height, means slidable mounting said work holder rack on said standard,

g. said work holder rack being retained slidably inside of said standard by guides mounted to said work holder rack at each end of the lower cross bar enclosing inside edges of outer rails of said standard while upper end of said work holder rack is retained by guides that are mounted on top cross bar of said standard,

h. a pair of vertically spaced workpiece support holder means slidably adjustable in the slot of the work holder rack and moveable therewith relative to the said standard without modifying the spacing between said workpiece holder means,

i. a rack support on said standard,

j. connecting means of said rack support on bottom cross bar of said standard extending upward and connected to bottom of said work holder rack whereby said workpiece support holders and picture blank thereon can be vertically positioned in front of the person,

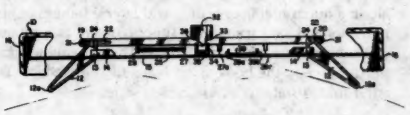
k. said connecting means comprising a fixed bar secured to said standard and extending vertically through an adjustable slotted head rigidly secured to said work holder rack, said slotted head contains several perforated locking clutch plates and spring to cant said locking clutch plates causing the edges of its perforations to grip the said bar and thus maintain the relative position of the fixed and adjustable members.

4,610,415

## TILTABLE SUPPORT

Robert J. Miller, Salford, Pa., assignor to Decision Data Computer Corporation, Horsham, Pa.

Filed Jun. 22, 1983, Ser. No. 506,901
Int. Cl.[4] A47B 91/02
U.S. Cl. 248—455 6 Claims



1. In a keyboard console or the like, a support mechanism comprising a pair of spaced apart support feet disposed along one side of the console, means pivotally mounting each of said feet on said console for movement to selected angular positions in a plane which is substantially parallel to said one side, each of said feet being movable between an extended position in which the console is at maximum tilt and a retracted position in which said console is at minimum tilt, and control mechanism for controllably adjusting the positions of each of said feet to a plurality of said angular positions including said extended and retracted positions and at least one intermediate position, comprising a pair of links extending in parallel relationship along said one side of said console, a pivotal connecting means connecting one end of one link with one foot and the opposite end of the other link with the other foot at points on said feet offset from the pivotal mounting means whereby said feet are moved from the retracted to the extended position upon lengthwise movement of the links, means biasing the links for movement along the long axes thereof in directions causing pivotal movement of said feet from the retracted towards said extended positions and control means for controllably releasing said links for movement of said feet towards said extended positions under the action of said biasing means, said control means including stop means engagable with each said link at spaced positions lengthwise of the links and actuating means selectively operable for selectively disengaging and engaging said stop means at said spaced positions.

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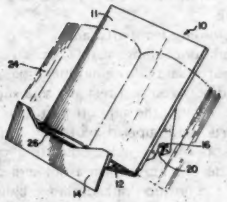
4,610,416

## BOOK HOLDER

Dai S. Choi, 3101 Palm Ave., Manhattan Beach, Calif. 90266

Filed Dec. 21, 1984, Ser. No. 684,796
Int. Cl.[4] A47B 97/08
U.S. Cl. 248—459 6 Claims



1. A one-piece foldable book stand formed from a single piece of sheet material for use in a substantially flat surface, which comprises,

a front surface and a rear surface,

said front surface having substantially parallel transverse crease lines disposed across the lower portion thereof, said front surface being folded on itself in opposite directions along said crease lines to form a front stand portion, and a support portion on one end of said front stand portion

supporting the front stand portion at an angle above said flat surface and the other end thereof having a raised peripheral lip portion for preventing the pages of a book from turning,

said rear surface having triangular lateral flanges which are extendable from the rear surface along respective vertical crease lines and a

transverse support member extendable from the rear surface along a horizontal crease line, said lateral flanges containing slots and said transverse support member containing end tabs as an integral part thereof for engaging in said slots, whereby the book stand is readily convertible from a flat folded state to an assembled state.

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**4,610,417**

## FOLDING MUSIC HOLDER

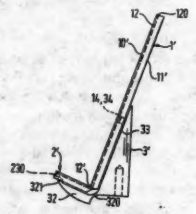
**Dietmar Kuss, Scapinellistrasse 13, 8000 Munich 60, Fed. Rep. of Germany**

**Filed May 24, 1984, Ser. No. 613,262**

**Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319166; Feb. 3, 1984, 3403849**

**Int. Cl.[4] A47B 97/08**

**U.S. Cl. 248—460** **1 Claim**




1. A music holder comprising:

a folding desk having

a rest having a horizontal transverse axis and a homogenous, flush surface inclined against the vertical when in an operating position, and

a support part disposed parallel to the horizontal and projecting from said rest at substantially a right angle when in the operating position,

said support part being hingedly connected to said rest by a hinge band running from one end of said desk to the other end parallel to the transverse axis;

said rest having

at least two folding rest parts, and

at least one additional hinge band connecting every two of said rest parts, said additional hinge band crossing the hinge band between said rest and said support part and extending through the support part,

said rest parts, said support part, and said hinge bands forming said folding parts consisting of a one-piece plastic plate having a flush front and a rear with a groove at the position of each hinge band;

a carrier for supporting said desk in an operating position having

a support surface for supporting the rear of said rest,

a support bracket for supporting said support part of said desk being located at approximately a right angle to said support surface of said carrier,

means for detachably connecting said support surface of said carrier to the rear of said rest, and

means for detachably connecting said support part of said desk to said support bracket of said carrier; and

means for connecting said carrier to a top end of a tripod.

**4,610,418**

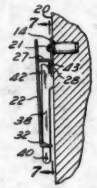
## WALL MOUNTED SUPPORT DEVICE

**Charles H. Graham, 7281 South 3100 West, Salt Lake City, Utah 84121**

**Filed Jun. 12, 1984, Ser. No. 619,817**

**Int. Cl.[4] A47G 1/24**

**U.S. Cl. 248—495** **8 Claims**




1. A support device for detachably mounting hangable object against a wall so that the support device is hidden from view by said object, comprising:

a first element having a mounting plate adapted for attachment to one of said object or wall in nonrotational relationship, including a stabilizer having an initial fixed rotational orientation and capable of being adjusted to selected fixed orientations rotated from said initial rotational orientation relative to said mounting plate; and

a second element adapted for attachment to the other of said object or wall in nonrotational relationship, including means for coupling in rotational relationship with said first element to support said object from said wall and means for coupling with said stabilizer so that a fixed rotational orientation of said object with respect to said wall is adjustably determined by the rotational orientation of said stabilizer member.

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**4,610,419**

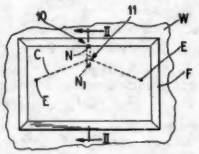
## PICTURE HANGER

**Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025**

**Filed Sep. 10, 1985, Ser. No. 774,582**

**Int. Cl.[4] F16M 13/00; A47G 1/16**

**U.S. Cl. 248—547** **11 Claims**

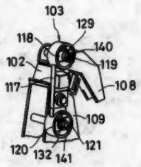



1. A picture hanger comprising a rigid strip having an upright back, an outturned top leg, a downwardly and inwardly inclined skirt depending from the outer end of the top leg, a first nail hole through the outer end of the leg, a second nail hole through the back adjacent the skirt to receive a nail extending through the first hole, a third nail hole in the lower portion of the back, and an open top, open end continuous planar sidewall wedge hook on the back above the third nail hole, with the planar sidewalls spanning the entire distance between the open ends, whereby a first nail extending through the first and second nail holes is inclined to be driven into a wall at an angle, a second nail extending through the third hole is driven into the wall below the first nail to prevent swinging of the hook on the wall, and said wedge hook friction locks a picture cord therein under the weight of a suspended picture.

## 4,610,420
## APPARATUS FOR MOUNTING POWER UNIT

Masao Fukushima, and Shin Takehara, both of Machida, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 15, 1985, Ser. No. 702,191
Claims priority, application Japan, Feb. 16, 1984, 59-26033; Feb. 20, 1984, 59-28717
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—550 14 Claims




1. An apparatus for mounting a power unit to a vehicle comprising a first elastic member for a first force transmission line comprising a rubber-like elastic member and a second elastic member for a second force transmission line comprising rubber-like members and a mass member disposed between said rubber-like members, said first and second force transmission lines arranged functionally substantially parallel to each other, and said second elastic member having a means for engaging and disengaging at least part of said mass member with and from said force transmission line of said second elastic member.

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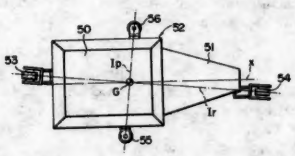
## 4,610,421
## MOUNTING CONSTRUCTION FOR ENGINE-TRANSMISSION ASSEMBLY

Yoshio Ohta; Tadashi Kimura; Kiyoteru Ijichi, and Masaaki Takizawa, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 11, 1983, Ser. No. 540,562
Claims priority, application Japan, Feb. 4, 1983, 58-017832
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—550 3 Claims




1. A mounting structure for mounting an engine-transmission assembly (52) in a vehicle, particularly laterally to a body of the vehicle, comprising:

a first and a second elastic support device (53, 54) which elastically support said engine-transmission assembly at opposite ends thereof, respectively, substantially along a rolling axis of inertia (Ir) thereof; and

a third and a fourth elastic support device (55, 56) which elastically support said engine-transmission assembly at opposite sides thereof, respectively, substantially along a pitching axis of inertia (Ip) thereof wherein said first and second elastic support devices each further comprise a block type device and which operate together to support a major portion of the weight of said engine-transmission assembly and wherein said third and fourth elastic support devices each further comprise means for presenting a variable spring constant and/or damping coefficient according to driving conditions of the vehicle and which operate together to support rotational moment of said engine-transmission assembly around said rolling axis of inertia thereof.

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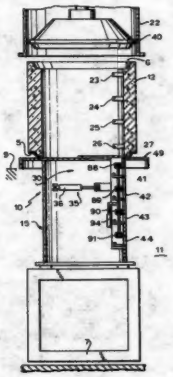
## 4,610,422
## MOULDING APPARATUS FOR SHAPING CONCRETE PARTS

Richard Kraiss, Laichingen-Suppingen, Fed. Rep. of Germany, assignor to Georg Prinzing GmbH & Co. KG Betonformen- Und Maschinenfabrik, Blaubeuren, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,640
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404287; Jun. 22, 1984, 3422981
Int. Cl.[4] B28B *7/30*
U.S. Cl. 249—94 38 Claims




1. A moulding apparatus for shaping concrete parts provided with a plurality of projecting elements to be cemented from inside of the concrete part into the concrete part, said moulding apparatus comprising:

a mould core having a shaped contour, a central axis, a core wall made of a plurality of wall portions, a top cover and a fitting-in device so that during shaped, the projecting elements can be fitted and cemented into the concrete part to be formed, said fitting-in device having at least one core segment forming at least one wall portion of said core wall;

a drive device for moving said core segment relative to the remaining wall portions of said mould core out of said shaped contour into a release position which permits a concrete part to be removed, and back into a closed position in which said core segment fits into said remaining wall portions of said mould core, completing said contour, said one wall portion and said remaining wall portions having mutually adjacent lateral edges whcih are substantially parallel to said central axis of said mould core;

guide members and guides located on and extending from said one wall portion and said remaining wall portions in the region of said mutually adjacent lateral edges, said guide members and guides automatically entering into a guiding engagement with one another upon insertion of said core segment, said drive device actuating two spaced-apart guide members to reciprocate in a translatory manner, and upon insertion of said core segment being automatically coupled form-lockingly in a translatory manner with one wall portion of said core segment; and

a plurality of housings each having an associated clamping device and an associated clamping drive, one said housing being provided for each projecting element to the cemented in, said core segment together with said housings,

said clamping devices and said clamping drive being detachably and exchangeably supported on said remaining wall portions of said mould core.

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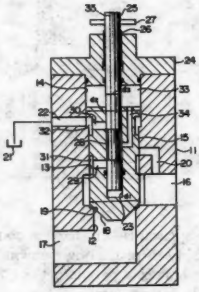
## 4,610,423
## POPPET VALVE

Ichiro Morino, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,579
Claims priority, application Japan, Mar. 6, 1984, 59-31829[U]; Mar. 8, 1984, 59-33387[U]
Int. Cl.⁴ F16K *31/12*
U.S. Cl. 251—25 6 Claims



1. In a poppet valve operable under a comparatively high back pressure, comprising:

a valve casing having an internal bore opening upwardly;

a cover plate provided to close said opening;

a poppet inserted slidably in said internal bore, said poppet having a tapered surface portion operable as a valve which is engageable with a valve seat formed around said internal bore;

a pilot spool slidable within a central hole of said poppet;

inlet and outlet ports opening into said internal bore at positions located on different sides of said valve seat for supplying and delivering a pressurized fluid in and out of said internal bore; and

first and second passage means for introducing and discharging, under the control of said pilot spool, a part of said pressurized fluid in and out of a chamber formed between said cover plate and an upper end of said poppet, thereby displacing said poppet toward and away from said valve seat, the improvement wherein means are provided to hold said pilot spool at a desired position, and said poppet is formed with a stepped construction having an upper end portion of a diameter $d_2$ and a lower end portion of a diameter $d_1$, said pilot spool having a diameter $d_3$, and the relation

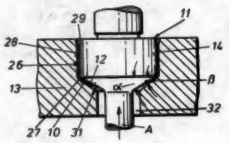
$$(d_2^2 - d_3^2) > d_1^2$$

holds for the diameters $d_1$, $d_2$ and $d_3$.

## 4,610,424
## SHUT-OFF VALVE

Manfred Koppers, Duisburg; Karlheinz Bohnes, Bochum; Kuno Guse, Dortmund, and Friedel Amling, Gelsenkirchen-Horst, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhuette Heintzmann GmbH & Co Kg, Bochum, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,834
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342405
Int. Cl.⁴ F16K *47/04, 1/38*
U.S. Cl. 251—121 6 Claims



1. A shut-off valve with high switch frequency for liquid fluids under high pressure, particularly high pressure water, comprising a valve housing provided with a sealing seat; an actuating plunger movable in said valve housing and having an axis and a sealing cone which is pressable under the action of a fluid pressure and a spring-loaded return force against said sealing seat of said valve housing; a cylindrical throttling piston; and a cylindrical receiving opening for said throttling piston, said sealing seat being formed as a conical sealing surface, said sealing cone being formed so that in a closing position of the valve it abuts against said conical sealing surface and forms a part of said cylindrical throttling piston, said sealing surface being associated at its end with said cylindrical receiving opening for said throttling piston, said throttling piston having an outer diameter and said receiving opening having an inner diameter dimensioned relative to one another so that a throttling gap is formed between said receiving opening and said throttling piston, said sealing cone having a first angle of inclination relative to a plane extending transversely to said axis, said sealing surface having a second angle of inclination relative to said plane, said first angle of inclination of said sealing cone being smaller than said second angle of inclination of said sealing surface.

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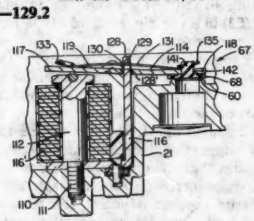
## 4,610,425
## FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Samuel T. Kelly, Torrance, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 613,462, May 24, 1984, Pat. No. 4,549,571.
This application Apr. 15, 1985, Ser. No. 723,066
Int. Cl.⁴ F16K *31/10*
U.S. Cl. 251—129.2 7 Claims



1. In a valve construction having a frame pivotally carrying a lever that has a valve member thereon, said frame having spring means operatively interconnected to said lever to tend to hold said lever in one pivoted condition on said frame, said

spring means comprising a leaf spring having opposed ends, said frame having an electrical coil means for attracting said lever to another pivoted condition in opposition to said spring means when said coil means is energized, the improvement wherein said frame has an arm provided with a free end that has a first portion thereof engaging said lever to define pivot point means for said lever and a second portion thereof engaging said leaf spring intermediate said opposed ends thereof to flex said leaf spring intermediate said opposed ends thereof.

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## 4,610,426
## PIEZOCERAMIC VALVE PLATE FOR A LOW-PRESSURE INJECTION VALVE AND PROCESS FOR THE PRODUCTION THEREOF

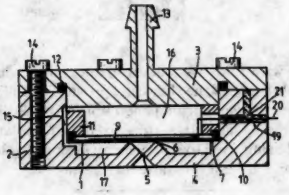
**Burkhard Brandner, Werdohl, Fed. Rep. of Germany, assignor to Atlas Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany**

**Filed Jul. 3, 1985, Ser. No. 752,316**

**Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425290**

**Int. Cl.⁴ F16K *31/04***

**U.S. Cl. 251—129.06** **3 Claims**



1. For a low-pressure injection valve, a piezoceramic valve plate as a flexural resonator, the valve plate having a carrier plate and on one side or on both sides silvered piezoceramic plates held by a binding layer, characterized in that the carrier plate consists of a metallic glass and that the binding layer is a soft solder with Zn as main component and an alloy suppressor such as Pb, Cd, and/or Ag.

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## 4,610,427
## PIEZOELECTRIC CONTROL VALVE FOR FUEL INJECTOR OF INTERNAL COMBUSTION ENGINE

**Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Toru Yoshinaga; Seiko Abe, both of Okazaki, and Yukihiro Natsuyama, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Apr. 16, 1985, Ser. No. 723,896**

**Claims priority, application Japan, Apr. 17, 1984, 59-75798; Nov. 13, 1984, 59-239664; Jan. 10, 1985, 60-2769**

**Int. Cl.⁴ F16K *31/02***

**U.S. Cl. 251—129.06** **17 Claims**

1. A piezoelectric control valve for a fuel injector, which comprises

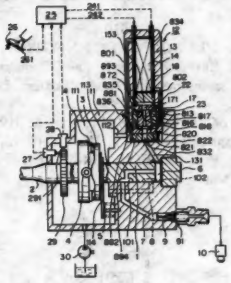
a housing having formed within a high-pressure fuel passage, a low-pressure fuel passage, and a bore, said high-pressure fuel passage communicating with an external mechanism for ejecting a high-pressure fuel, said low-pressure fuel passage communicating with an external storage portion for holding a low-pressure fuel therein, said passage opening in said bore,

a valve slidably arranged within the bore of the housing to connect the high-pressure fuel passage and the low-pressure fuel passage to each other or to disconnect said fuel passages from each other,

a piezoelectric element laminate which expands and contracts according to the voltage applied and,

a piston which is reciprocatively moved according to the expansion and contraction of the piezoelectric element laminate to change the pressure within a pressure chamber formed between the piston and the valve,

wherein the valve is moved forward and backward according to the pressure difference between pressure-receiving



surfaces, on which the pressure within the pressure chamber is applied, to connect the high-pressure fuel passage and the low-pressure fuel passage to each other or to disconnect said fuel passages from each other.

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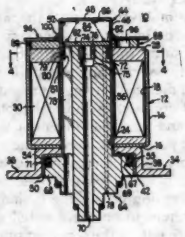
## 4,610,428
## HERMETICALLY SEALED ELECTROMAGNETIC SOLENOID VALVE

**Clarence D. Fox, Decatur, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.**

**Continuation of Ser. No. 710,760, Mar. 11, 1985, abandoned. This application Oct. 30, 1985, Ser. No. 793,020**

**Int. Cl.⁴ F16K *31/06*; H01F *7/08***

**U.S. Cl. 251—129.16** **32 Claims**



21. An electromechanical valve assembly comprising:

an electrical winding;

a magnetic flux circuit comprising a plurality of adjacent magnetic segments, including a generally cylindrical center segment defining at least one longitudinal passage and a central fluid passage, and having a first surface, an outer segment, and a top segment, at least one of said segments being movable to adjust the extent of an air gap adjacent the movable segment;

a non-magnetic seat member, having a central opening aligned with, and disposed near, one end of said central fluid passage;

a magnetic closure armature member, positioned adjacent the non-magnetic seat member; and

a non-magnetic member defining a blind-hole passage to receive said armature and said cylindrical center segment, said armature with said magnetic segments completing a flux path, such that fluid flow urged by a predetermined pressure difference through the central fluid passage and seat member central opening can be modulated by varying the energization level of the electrical winding, movement

of the adjustable segment being effective to vary the air gap distance and thus vary the reluctance of the flux path, to correspondingly adjust the response of the valve assembly for a given energization level of the electrical winding and given pressure difference.

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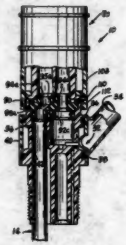
**4,610,429**

## PLUMBING CONNECTION

**Don C. Arnold, Buffalo Grove, Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Sajar Plastics, Inc., Middlefield, Ohio**

**Continuation of Ser. No. 488,097, Apr. 25, 1983, abandoned.**
**This application Nov. 1, 1985, Ser. No. 794,320**
**Int. Cl.[4] F16K *51/00***
**U.S. Cl. 251—148** **5 Claims**



5. A plumbing fixture comprising:

a supply conduit having a main body portion of substantially uniform wall thickness, said supply conduit having an expanded end portion integral with said main body portion, said expanded end portion defining a shoulder portion and having a cylindrical portion with a partially tapered inner wall;

a valve mounting body having a throughbore and a smooth counterbore defining a shoulder stop to slidably receive in a seated position the shoulder portion of said expanded end portion of said supply conduit;

a resilient seal member having a main disc portion with first and second opposed cylindrical tubular portions integral therewith, and in communication with each other, said first tubular portion received in the expanded end portion of said supply conduit, each of said tubular portions being made of a sufficiently resilient material so that said tapered inner wall portion causes the cylindrical tubular portion received therein to contract radially inward and so that fluid pressure within the received tubular portion causes it to expand radially outward thereby forming a circumferential seal; and

a valve having a threaded collar, said valve being removably secured to said valve body by said threaded collar, said valve having an input port to receive said second opposed tubular portion of said seal member, said valve constructed and arranged to apply pressure against said seal member to retain said supply conduit in a fully seated position.

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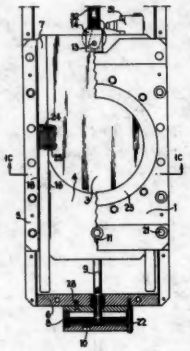
**4,610,430**

## SELF CLEANING VALVE FOR POWDERY, GRANULAR AND PASTY PRODUCTS

**Henri Besnard, and Daniel Fremau, both of Fecamp, France, assignors to Trouvay & Cauvin S.A., Le Havre and Aldo Morello, Villeurbianne, both of, France, a part interest**

**Filed Jul. 9, 1985, Ser. No. 753,213**
**Claims priority, application France, Jul. 11, 1984, 84 11042**
**Int. Cl.[4] F16K *3/316, 25/00***
**U.S. Cl. 251—327** **13 Claims**

1. A guillotine valve, comprising a plate movable in translation between a front body and a rear body of the valve, said two bodies each having an orifice formed therethrough which may be selectively masked or uncovered by said plate mounted for sliding between the bodies, said movable plate being provided laterally with two section members in the form of an elongate rule, integral with the plate and longer than said plate, said section members forming arms of said plate and sliding in



slides integral with said two bodies of the valve while each filling the whole space of the slides and preventing the product flowing through the valve from penetrating into the slides and accumulating there, said plate arms fixed to the plate being removable and being fixed to said plate by means of at least one centering pin and at least one fastening means.

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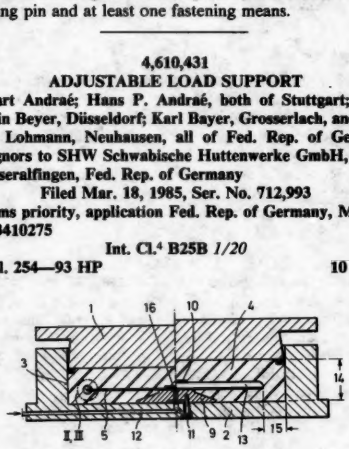
**4,610,431**

## ADJUSTABLE LOAD SUPPORT

**Wolfhart Andraé; Hans P. Andraé, both of Stuttgart; E. H. Erwin Beyer, Düsseldorf; Karl Bayer, Grosserlach, and Manfred Lohmann, Neuhausen, all of Fed. Rep. of Germany, assignors to SHW Schwabische Huttenwerke GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany**

**Filed Mar. 18, 1985, Ser. No. 712,993**
**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410275**
**Int. Cl.[4] B25B *1/20***
**U.S. Cl. 254—93 HP** **10 Claims**



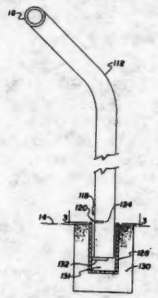
1. An adjustable load support for lifting and lowering heavy loads, comprising a hollow container having a bottom, sidewalls, and a liftable top, sealing means for sealing a portion of said top within said hollow container, an elastomeric mass substantially filling the interior of said container, means for introducing a pressurized medium into the interior of said container, and a diaphragm between the bottom of said elastomeric mass and the bottom of said container, said diaphragm being substantially parallel to the plane of the bottom of said container and having an edge which is not in contact with the sidewalls of said container, whereby hydraulic fluid is introduced into said container between said diaphragm and said elastomeric mass through an opening in said diaphragm, and said top is lifted upwards.

4,610,432

## BREAK-AWAY FENCE FOR HORSE RACE TRACKS

Robert T. Lewis; George F. Dwyer, Jr., and John W. Payne, all of Louisville, Ky., assignors to Race-Rail, Inc., Louisville, Ky.

Filed Jul. 2, 1982, Ser. No. 394,781
Int. Cl.[4] E04H 17/14
U.S. Cl. 256—65 17 Claims



1. A break-away fence post, comprising:
means defining a hollow interior, and
means defining a groove formed in the wall of said hollow post, said groove circumscribing only a portion of the periphery of said hollow posts and penetrating the wall of said hollow post.

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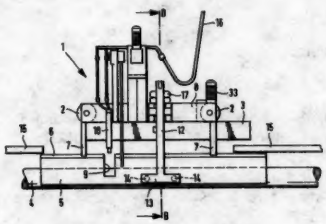
4,610,433

## TORCH-CUTTING MACHINE FOR THERMALLY CUTTING ELONGATE MEMBERS

Horst K. Lotz, Wiesbaden-Delkenheim, Fed. Rep. of Germany, assignor to Aute Gesellschaft fuer autogene Technik mbH, Forch, Switzerland

Filed Apr. 12, 1985, Ser. No. 722,443
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1984, 8412636[U]
Int. Cl.[4] B23K 7/00
U.S. Cl. 266—50 13 Claims



1. A torch cutting machine for thermally cutting hot elongated members which bend easily and which are conveyed horizontally at varying speeds and direction of movement, said cutting machine comprising:
a torch carriage movable longitudinally on a track parallel to the direction of travel of the elongated member, said torch carriage member including a main frame structure and a clamping and cutting frame structure;
a torch mounted to said torch carriage;
clamping means for selectively engaging the elongated member, said clamping means mounted to said torch carriage wherein said torch carriage is movable in conjunction with the elongated member when said clamping means are engaged with the elongated member;
a protective hood for protecting the cutting machine from the radiating heat of the elongated member, said protective hood secured to said torch carriage and disposed beneath said torch carriage between the elongated member and the cutting machine, said hood partially enclosing the portion of the elongated member substantially beneath said torch carriage, wherein said hood includes openings through which said torch and said clamping means extend in order to engage the elongated member;
wherein said clamping and cutting frame structure includes separate drive means for drivably moving said clamping and cutting frame structure in relation to said main frame structure.

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4,610,434

## SAFETY ARRANGEMENT IN GAS-CUTTING LANCES

Arne Larsson, Stockholm, Sweden, assignor to Svensk Termo-Ekonomi AB, Bromma, Sweden

PCT No. PCT/SE84/00194, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO84/04777, PCT Pub. Date Dec. 6, 1984
PCT Filed May 18, 1984, Ser. No. 702,235
Claims priority, application Sweden, May 20, 1983, 8302894
Int. Cl.[4] B23K 7/08
U.S. Cl. 266—75 13 Claims

1. In a gas-cutting lance in which one end of the lance, the attachment end, is connected to a gas-supply means such as a handle through which gas, e.g., oxygen, can be caused to flow through said lance, the lance comprising a hollow tube in which there is normally arranged a core of closely packed filaments, the tube and core, if present, comprise material of high iron content and being intended to melt progressively at the free end thereof and to combust, oxidize, at least partially: the improvement of safety sleeve means comprising at least one substantially tubular sleeve (8, 9) member located in the vicinity of the attachment end (2) of the lance, a portion (5) of the hollow-tube of the lance being devoid of core material (6) in said vicinity of said attachment end; and in that each sleeve (8, 9) being made from a material intended and arranged to surround the gas flow-path and to prevent or arrest said melting and burning process, so as to extinguish the combustion of said lance when said melting and burning thereof reaches said at least one sleeve (8, 9).

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4,610,435

## INDUSTRIAL FURNACE FOR THE THERMAL TREATMENT OF METAL WORKPIECES

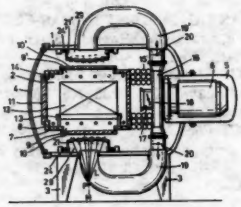
Hans Pfau, and Albert Fleiter, both of Kleve, Fed. Rep. of Germany, assignors to Ipsen Industries International GmbH, Kleve, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,358
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346884
Int. Cl.[4] C21D 9/00
U.S. Cl. 266—250 13 Claims

1. In an industrial furnace, especially a single chamber vacuum furnace, for the thermal treatment of non-uniformly shaped charges and metal workpieces; wherein the furnace includes a heating chamber, which is disposed in a furnace housing, and is adapted to receive a charge; wherein the heating chamber can be heated by heating elements, and is provided with at least one closable chamber opening through which cooling gas can be delivered to said charge; wherein the cooling gas is delivered to said chamber openings via respective delivery pipes, and is circulated via a blower through said

delivery pipes, said heating chamber, and a heat exchanger; wherein a distribution means, which is moved back and forth during a cooling process, is pivotably mounted in the vicinity of each of said chamber openings so that supply of cooling gas from above and below the charge can be regulated and, as a result, non-uniformly shaped charges can be uniformly cooled since a greater quantity of heat can be dissipated from a given side thereof;

comprising the improvement in combination therewith wherein said distribution means is in the form of jet nozzles pivotally mounted and provided at each of said chamber openings to control and regulate jet flow of said cooling gas adaptable to flow resistance of said charge, as said



cooling gas comes from said delivery pipes, in a location directly before said chamber openings so that said cooling gas flows through said jet nozzles prior to striking said charge to enhance useful life expectancy of said jet nozzles and without need for thermal protection of said jet nozzles so that heat can be dissipated outwardly continuously by said jet nozzles due to lack of thermal protection and also to save energy in that said jet nozzles are kept from having to be heated-up and cooled-off unnecessarily for overall increase in heat-technical effeciency of the furnace, flow direction of said cooling gas being reversible via control and regulation thereof to adjust to optimum cooling conditions.

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**4,610,436**

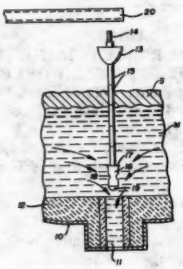
**SLAG RETAINING DEVICE WITH SELF-ALIGNING TIP**

**Michael D. LaBate, II, Ellwood City, and Joseph A. Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio**

**Filed May 6, 1985, Ser. No. 731,011**

**Int. Cl.⁴ B22D *41/10***

**U.S. Cl. 266—272** **6 Claims**



1. An improvement in a device for the retention of slag during drawing off molten steel from a tapping converter provided with a tap hole, the device comprising a closure having a specific gravity lower than said steel but higher than said slag and of a size to effectively seal said tap hole and having elongated depending guide means capable of engaging in said tap hole; the improvement wherein said guide means consists of an elongated guide member of a known diameter and a tip portion of a diameter at least as large as said known diameter of said guide member, pockets formed in said tip portion forming configurations engageable by said steel being drawn off from said tapping converter through said tap hole whereby said tip portion of said guide member is moved into alignment with and through said tap hole.

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**4,610,437**

**CRUCIBLE FOR HOLDING SALT BATHS FOR THE BORIDING OF STEELS**

**Ulrich Baudis, Hanau; Peter Biberbach, and Rainer Engelmann, both of Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Jul. 12, 1984, Ser. No. 630,303**

**Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328355**

**Int. Cl.⁴ C22C *38/40*; F27B *14/00***

**U.S. Cl. 266—275** **8 Claims**

5. A combination consisting of a crucible suitable for containing a salt bath for the boriding of steel, said crucible being made of a steel consisting essentially of 0.05–0.8 wt. % carbon, 0.8–2.5 wt. % silicon, 0.1–2.0 wt. % manganese, 6–30 wt. % chromium, 0–1.5 wt. % aluminum, 4–39 wt. % nickel, balance iron, and a boriding salt bath in the crucible.

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**4,610,438**

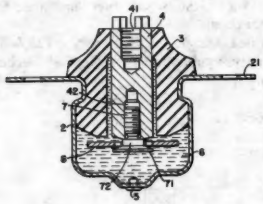
**HYDRAULICALLY DAMPED ELASTIC MOUNTING**

**Günter Eberhard, Gehrden, and Jürgen Heitzig, Hanover, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany**

**Filed Feb. 9, 1984, Ser. No. 578,566**

**Int. Cl.⁴ F16F *1/36***

**U.S. Cl. 267—8 R** **5 Claims**



1. A hydraulically damped elastic mounting for a drive motor in motor vehicles, the improvement therewith comprising:

a pot-shaped housing containing damping fluid;

a ring-shaped rubber spring member for sealing-off said housing;

a rigid connecting member which passes centrally through said spring member forming a tight fit therewith; said connecting member being provided with predetermined buffer surfaces which essentially face one another, said buffer surfaces extending inclined in an outward radial direction and disposed continuously further away from one another; and

a damping disk of rigid material, said disk being immersed in said damping fluid, and being disposed on said connecting member, between said buffer surfaces, in such a way as to be movable in an axial direction although guided positively in radial direction; said damping disk furthermore being provided, in the vicinity of said buffer surfaces, with passages for the flow of said damping fluid; said damping disk being stabilized against cavitation; said damping disk being star-shaped and comprising several vanes which are in the form of truncated segments of a circle, and are

distributed about the periphery of said damping disk at predetermined angular spacings.

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4,610,439

## SERVICE SADDLE U-BOLT INSTALLATION HOLDER

Stanley M. Burghardt, 94-20 Plattwood Ave., Ozone Park, N.Y. 11417

Division of Ser. No. 531,430, Sep. 12, 1983, Pat. No. 4,519,124. This application Jan. 25, 1985, Ser. No. 695,197

Int. Cl.[4] B25B *3/00*

U.S. Cl. 269—3 2 Claims

1. A utility service saddle U-bolt and holder for connecting the U-bolt to a saddle, comprising an elongated, manually manipulable handle which is generally vertically disposed during use and having a projecting lower end which is disposed substantially horizontally during use to thereby provide respective upwardly and downwardly facing surfaces and laterally oppositely facing sides, a saddle U-bolt clamp having handle attachment means releasably attached to and projecting laterally from one of said sides of said lower end of the handle, said clamp comprising a body portion disposed generally horizontally during use and having laterally opposite sides and a pair of laterally spaced apart channel-leg portions respectively on said opposite sides of said body portion and disposed vertically during use thereby providing a substantially upwardly facing channel-shaped clamp for receiving said U-bolt, and laterally disposed, manually tightenable thumb-screw means on and extending through one of said channel-leg portions for engaging and temporarily retaining said U-bolt within said clamp, said clamp handle attachment means comprising a pair of normally horizontally disposed, vertically spaced apart upper and lower support arms on and projecting laterally outward from the other of said channel-leg portions of said clamp and receiving said upwardly and downwardly facing surfaces of said handle lower end therebetween, and vertically disposed, manually tightenable thumb-screw means on and extending through said upper support arm into retaining engagement with said upwardly facing surface of said handle lower end, said lower support arm and said clamp body portion being substantially aligned within the same plane, and a U-bolt received in and held by said clamp thumb-screw means at a middle-length location along the U-bolt within said upwardly facing channel-shaped clamp with the legs of the U-bolt projecting upwardly and aligned parallel to the plane of said handle and its said lower end.

4,610,440

## SELF-CONTAINED WORKPIECE-HOLDING DEVICE, PREFERABLY EQUIPPED WITH AN OPERATING SYSTEM, AND ALSO ADVANTAGEOUSLY PROVIDED WITH INDIVIDUAL POWER-CYLINDER OPERATING MEANS FOR OPERATING IT AT AN INDEPENDENT PRESSURE

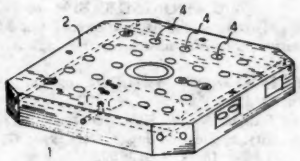
Dominique Casset, Saint Valerien, France, assignor to Mors, France

Filed Nov. 20, 1984, Ser. No. 673,343

Claims priority, application France, Nov. 25, 1983, 83 18865; Jan. 10, 1984, 84 00296; Oct. 12, 1984, 84 15696

Int. Cl.[4] B23Q *7/00*

U.S. Cl. 269—20 23 Claims




1. A device adapted to hold a workpiece of the type including compressed-fluid power-cylinders incorporated within orifices provided in the upper face of said device; fastening means adapted to be mounted on said upper face for fastening, by tightening or clamping, said workpiece through the medium of said compressed-fluid power-cylinders; a fluid pressure generator for feeding said compressed-fluid power-cylinders through a compressed fluid circuit; and a source of power for actuating said fluid pressure generator; wherein said pressure generator and said source of power are each incorporated in a recess of said device which is thus self-contained and said compressed-fluid circuit includes an integrated circuit constituted by passage-ways provided within the body of the device.

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4,610,441

## EXPANSION SLEEVE FOR APPLYING PRECISE CIRCUMFERENTIAL STRESS

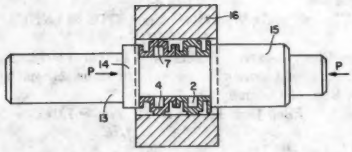
Hans Hofmann, Ruckersdorf, and Heinz Ziegler, Engelthal, both of Fed. Rep. of Germany, assignors to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge, Lauf, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,220

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406637

Int. Cl.[4] B23Q *3/14*

U.S. Cl. 269—48.1 5 Claims




1. An expansive sleeve for applying precisely centered expansion stress to a hollow workpiece by means of radial expansion brought about by axial pressure, said sleeve comprising outwardly open grooves and inwardly open grooves said outwardly open grooves being delimited by annular web members and annular stress covers, wherein at least one of said stress covers transmits force to the workpiece, and wherein each such stress cover is provided with thickened regions which are generally annular in form and which contain stress

surfaces that are limited by grooves whereby each stress cover itself forms a bottom of said grooves, and wherein a radial thickness of the thickened region is at least one-half greater than a thickness of the stress cover, wherein a curving of the stress cover occurs across its width and wherein the thickened regions of the stress cover each comprise a stress surface in the form of a cylindrical casing, and wherein the grooves formed by the stress cover are relatively wide, wherein a curving of the stress cover surfaces across their respective widths relative to the curving of the stress cover is substantially avoided during an expansion operation.

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**4,610,442**

## POSITIONING TABLE

**Kenichi Oku, Toyonaka, and Masaki Suzuki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co, Ltd., Osaka, Japan**

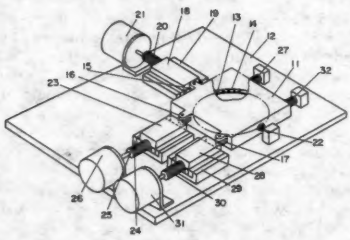
**PCT No. PCT/JP83/00363, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984**

**PCT Filed Oct. 19, 1983, Ser. No. 621,922**

**Claims priority, application Japan, Oct. 19, 1982, 57-183933**

**Int. Cl.⁴ B23Q *1/04***

**U.S. Cl. 269—73** **5 Claims**



1. A positioning table device comprising a flat table so supported as to be displaceable both angularly and linearly in a first plane, a first, a second and a third roller each having an axis of rotation perpendicular to said first plane, and a first, a second and a third feeding means each having an end face abutted against a corresponding one of said first, second and third rollers and being linearly movable in a plane parallel to said first plane such that the end face of said first feeding means is maintained perpendicular to the end faces of said second and third feeding means for all linear movements of first, second and third feeding means.

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**4,610,443**

## SUN VISOR AND METHOD FOR THE MANUFACTURE THEREOF

**Charles Ebert, Luxeuil, France, and Lothar Viertel, Saarlouis, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany**

**Filed Dec. 13, 1983, Ser. No. 561,049**

**Int. Cl.⁴ B60J *3/02***

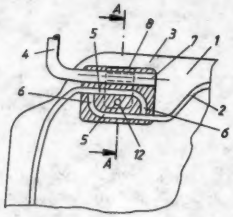
**U.S. Cl. 296—97 H** **8 Claims**

1. A method of fabricating a sun visor reinforcing frame and mounting housing combination, the method comprising: forming an elongate length of reinforcing material of thin width into a reinforcing frame;

disposing a region of the frame in an injection molding cavity, wherein the frame is that region is free of contact with the walls defining the mold cavity;

disposing a U-shaped spring in the cavity with the arms of the U of the spring straddling around at least part of the region of the frame in the cavity;

injecting a moldable plastic into the mold cavity for injection molding a mounting housing around the region of the



frame and the spring in the cavity for defining an injection molded mounting housing.

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**4,610,444**

## CONTROLLING SYSTEM FOR MECHANISMS DELIVERING SHEETS TAKEN OFF FROM A PILE IN A PROCESSING MACHINE

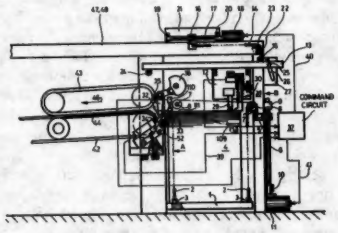
**Pierre Lang, Ecublens, and Georges Meylan, Preverenges, both of Switzerland, assignors to Bobst SA, Lausanne, Switzerland**

**Filed Mar. 30, 1984, Ser. No. 595,397**

**Claims priority, application Switzerland, Mar. 31, 1983, 1802/83**

**Int. Cl.⁴ B65H *1/08, 3/08, 5/02***

**U.S. Cl. 271—12** **10 Claims**



1. In a system for delivering sheets taken off from and at a front of a pile in a processing machine having a pile elevator, an infeed element with suckers near a rear of the pile, and means for lifting said pile with respect to a position of the uppermost sheet, wherein the improvement comprises:

front height detection means for detecting a height of the front of the sheet pile;

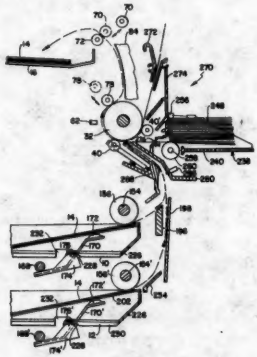
command circuit means connected to the front height detection means for controlling a motor connected to raise or lower the pile elevator in direct response to the front height detection means; and

rear height detection means at the rear of the sheet pile connected with said command circuit means for controlling a motor connected to lift or lower said infeed element with suckers in direct response to operation of said rear height detection means such that the rear of the sheet pile is adjusted relative to the infeed element without first observing the height of the front of the sheet pile.

## 4,610,445
## INTEGRATED PRINTER AND TRAY PAPER FEEDING APPARATUS

Helmut A. Schneider, Clifton, and Dominick Fazio, Whippany, both of N.J., assignors to Ziyad Incorporated, Denville, N.J.

Filed Sep. 20, 1983, Ser. No. 534,133
Int. Cl.[4] B65H 1/12
U.S. Cl. 271—160 22 Claims



1. A paper loading assembly for a printing device, said printing device including paper advancing means for advancing a sheet of paper within said printing device, said paper loading assembly comprising:

paper storing means for storing a plurality of individual sheets of paper, said paper storing means being insertable into and withdrawable from said printing device and having first and second spaced cam surfaces thereon; paper feeding means for feeding individual sheets of paper from said paper storing means along a paper feed path to said paper advancing means when said paper storing means has been inserted into said printing device;

engaging means movable between an operative position and an inoperative position, said engaging means being biased toward said operative position so as to be engageable with said paper storing means when said paper storing means has been inserted into said printing device to position the plurality of individual sheets of paper within said paper storing means into a position for feeding at least one of said individual sheets by said paper feeding means along said paper feed path, and said engaging means being movable to said inoperative position to permit said paper storing means to be inserted into and withdrawn from said printing device; and

a cam follower member engageable with said first and second cam surfaces on said paper storing means for controlling the positioning of said engaging means during insertion and withdrawal of said paper storing means relative to said printing device, said cam follower member and said first and second cam surfaces on said paper storing means being so arranged that said cam follower member engages said first cam surface upon initial insertion of said paper storing means into said printing device to move said engaging means from said operative position to said inoperative position and thereafter engages said second cam surface upon further insertion of said paper storing means within said printing device to permit said engaging means to return to said operative position and into engagement with said paper storing means when insertion of said paper storing means into said printing device has been completed, and so arranged that said cam follower member engages said second cam surface upon initial withdrawal of said paper storing means from said printing device to move said engaging means from said operative position to said inoperative position and thereafter engages said first cam surface upon further withdrawal of said paper storing means from said printing device to premit said engaging means to return to said operative position when withdrawal of said paper storing means from said printing device has been completed, whereby said engaging means is automatically moved to said inoperative position upon initial insertion or initial withdrawal of said paper storing means relative to said printing device and automatically returned to said operative position after said paper storing means has been inserted into or withdrawn from said printing device.

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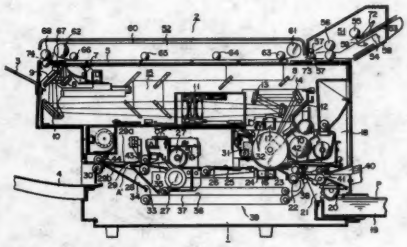
## 4,610,446
## SHEET MATERIAL TRANSPORTING APPARATUS

Fumito Ide, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1984, Ser. No. 685,782
Claims priority, application Japan, Dec. 27, 1983, 58-246397
Int. Cl.[4] B65H 29/00
U.S. Cl. 271—291 5 Claims



1. A sheet material transporting apparatus comprising:

first conveyance means for conveying a sheet having a predetermined elastic force and an image on one surface thereof in a first direction along a first conveyance path, the image being formed by an image forming section;

second conveyance means for conveying the sheet passed via the first conveyance path in a second direction along a second conveyance path positioned under the first conveyance path and extending to said image forming section where an image is formed on the other surface of the sheet;

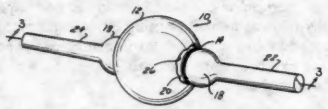
a discharge section for discharging the sheet conveyed via the first conveyance path;

trailing edge detecting means, arranged in the vicinity of a branched portion between the first and second conveyance paths, for detecting the trailing edge of the sheet;

a sheet guide section provided between said branched portion and said discharge section, said sheet guide section including a recessed guide member which causes said branched portion to communicate with said discharge section, and which has a projection extending downward; and

means for sending the sheet in the first direction for a predetermined period of time from the time the trailing edge of the sheet is detected by said trailing detecting means, and for directing the trailing edge of the sheet, by the correlation of the elastic force of the sheet and said projection, to the second conveyance path.

**4,610,447**
**JOGGER'S ROD**
Betty L. Byrd, 18 N. Glenwood, Pontiac, Mich. 48058
Filed Aug. 3, 1984, Ser. No. 637,318
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—70 5 Claims



1. A jogger's rod comprising:
an enlarged, hollow spherically shaped rigid body, the interior of which defines a compartment for the storage of personal items, said body having diametrically opposed apertures having smaller diameters than the spherically shaped body which are sized to permit access to said compartment and to permit the passage therethrough of said personal items for storage in said compartment;
a pair of elongated arm members extending perpendicularly from and enclosing said apertures and sized to be grasped by the user's hands on either side of said body, said arm members having a diameter less than the diameter of the spherically shaped body; and
means for releasably securing said arm members to said body apertures.

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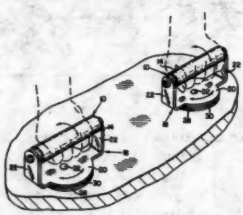
**4,610,448**
**HAND GRIP FOR PUSH-UPS**
David L. Hill, Star Rte. South, Box 399, South Beach, Oreg. 97366
Filed Jan. 27, 1984, Ser. No. 574,339
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—93 3 Claims



1. A method for doing push-ups comprising:
(a) providing a pair of spaced apart hand grips each having a handle and a base for supporting them on an underlying surface, said handle being rotatable relative to said base about vertical axes;
(b) supporting one's body in a prone position above said underlying surfaces by gripping said handles; and
(c) performing push-ups while simultaneously rotating said handles about said vertical axes.

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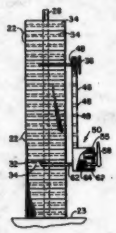
**4,610,449**
**AUTOMATIC WEIGHT SELECTOR**
George F. Diercks, Jr., 75 Balin Ave., So. Setauket, N.Y. 11720
Filed Aug. 26, 1985, Ser. No. 769,456
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 12 Claims

1. In a pin selected weight lifting machine comprising a stack of weights having aligned vertical openings therethrough, lifting means passing through said vertical openings in said weights, each of said weights having an opening transverse to its vertical opening to permit communication with the latter, and means comprising a first pin for passing through a transverse opening in a first weight for engaging said first weight with said lifting means for permitting said first weight and all weights stacked above to be lifted with said lifting means, the improvement comprising means attached to said pin for adding



additional weights to said weights being lifted thereby establishing an increased weight load on said lifting means and including means adapted to permit automatic release of only said additional weights after a predetermined period of time, where the first weight and all the weights stacked above the first weight will continue to be lifted by the lifting means.

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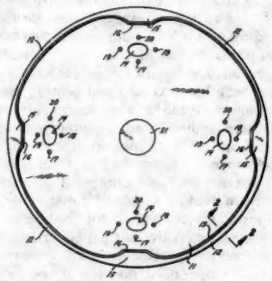
**4,610,450**
**POOL TABLE**
John N. Howell, General Delivery, Wasilla, Ak. 99687
Filed Feb. 22, 1983, Ser. No. 468,453
Int. Cl.[4] A63D *15/06*
U.S. Cl. 273—3 A 16 Claims



1. A pool table comprising:
a substantially circular table, the top surface of which forms a playing surface;
a plurality of pockets equally spaced around the table, with said pockets located on an imaginary circle which is concentric with said circular table but has a diameter significantly smaller than the diameter of said circular table so that said pockets are spaced inwardly from the perimeter of said circular table;
a cushion rail adjacent the perimeter of said circular table so that the cushion rail substantially surrounds said playing surface, said cushion rail having a plurality of inward projecting bumpers, there being at least as many bumpers as there are pockets, with mutually respective bumpers extending inwardly toward respective pockets, wherein the innermost edge of said bumper is spaced from said pocket and the inwardly facing edge of said cushion rail forms a substantially concave, substantially elliptical, smooth, continuous face between said bumpers; and,
colored indicia around each of said pockets, said colored

indicia comprising four marks equally spaced about the respective pocket, each of said four marks being of a different color.

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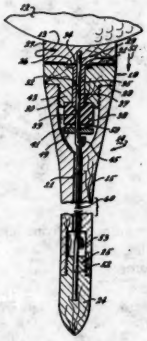
**4,610,451**
**GOLF TEE**
**Francis J. Keys, 9532 Cortada, El Monte, Calif. 91733**
**Filed Aug. 8, 1985, Ser. No. 763,539**
**Int. Cl.[4] A63B *57/00***
**U.S. Cl. 273—33** **6 Claims**



1. A golf tee comprising:
an elongated body section including an upwardly and outwardly flared upper end portion having an internally threaded opening and a lower end portion having an internally threaded opening with an axial hole joining the upper and lower openings;
a removable head unit including
a rotatable head section having a curved recess on the top thereof and a stationary head section having a threaded boss on the bottom thereof; and
a top rod member having a hook on the lower end thereof and having its upper end slideably extending through an axial hole in said stationary head section and anchored in an axial hole on the bottom of said rotatable head section;
said removable head unit being held by the threaded boss on the lower end of the stationary head section engaging the internally threaded opening on the upper end portion of said elongated body section;
a pointed bottom section having a threaded boss on the top thereof;
a bottom rod member having a hook on the upper end thereof and having its lower end anchored in an axial opening on the top of said pointed bottom section;
said pointed bottom section being held by the threaded boss on the upper end thereof engaging the internally threaded opening on the lower end portion of said elongated body section; and
a rubber band extending freely through the axial hole in said elongated body section with its upper end engaged over the hook on the top rod member and with its lower end engaged over the hook on the bottom rod member.

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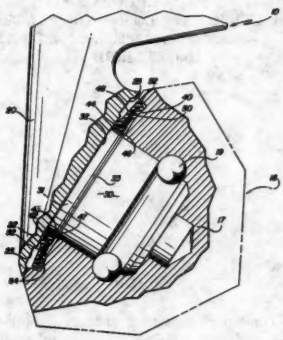
**4,610,452**
**BELLEVILLE SEAL FOR SEALED BEARING ROTARY CONE ROCK BITS**
**Keith A. DiRienz, El Toro, Calif., assignor to Smith International, Inc., Newport Beach, Calif.**
**Filed Jul. 8, 1985, Ser. No. 752,694**
**Int. Cl.[4] F16J *15/34***
**U.S. Cl. 277—83** **12 Claims**

1. A rotary cone rock bit having at least one belleville seal disposed between said rotary cone and a journal bearing extending from a body of said rock bit, said belleville seal comprising:
inner and outer peripheral circumferences formed by said seal, a metal ring comprises one of said circumferences, said ring being attached to a rubberlike compound, the other of said circumferences forming a resilient seal of said rubberlike compound, one of said circumferences forming a dynamic seal face,
at least one belleville spring is encapsulated within said compound being radially disposed between said inner and outer peripheries, said spring is isolated by said metal ring



such that there is no preload of the belleville spring during installation of said seal in said rock bit, said belleville spring contained within said compound is deflected between a journal and said cone during installation such that the spring is maintained at a point beyond the maximum seal load, said spring thus will maintain a constant load through small axial displacements of the rotating cone on said journal, said belleville spring will increase its load through further axial displacement as said dynamic seal surface wears against said rotating cone during rock bit operation.

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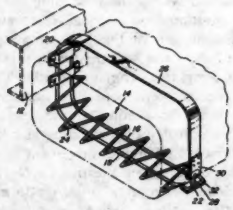
**4,610,453**
**WIRE FORM SUPPORT SYSTEM FOR FUEL TANKS**
**John D. Collier, Brantford, Canada, assignor to Tamco Limited, Windsor, Canada**
**Filed Jan. 10, 1985, Ser. No. 690,475**
**Claims priority, application Canada, Jun. 28, 1984, 457667**
**Int. Cl.[4] B60K *15/02***
**U.S. Cl. 280—5 A** **2 Claims**



1. A wire form fuel tank support for vehicles comprising a wire form bracket conforming generally in contour to approximately half of the transverse cross sectional contour of a tank to be supported, said bracket having spaced wire members terminating in end loops, load spreading means comprising wire reinforcing members interconnecting and extending an-

gularly across said spaced wire members, said reinforcing members being spaced substantially throughout the length of said spaced wire members; a strap member pivotally connected at one end to one of said wire member loops, said strap being adapted to extend over substantially the remaining transverse cross sectional contour of said tank, a fastening assembly at the other end of said strap for detachable connection to the other loop end of the wire members; and means for fastening a portion of said wire form bracket to a vehicle frame.

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**4,610,454**

**SHOPPING CART**

**William H. Gill, Rte. 179, Lambertville, N.J. 08530**

**Filed Mar. 27, 1985, Ser. No. 716,435**

**Int. Cl.[4] B62D *3/00***

**U.S. Cl. 280—33.99 A** **1 Claim**

1. The combination, with a grocery shopping cart of the type having a forward portion adapted to be nested within a like, preceding shopping cart and having a rear portion that projects rearwardly from said preceding cart in the nested relation of the carts, said cart including a basket the forward portion of which is adapted to enter the basket of the like, preceding cart, rear side frame members on the rear portion of said cart, said rear side frame members being transversely spaced to define a space in the rear portion of the cart below the portion of the basket not entering the basket of the preceding cart, and horizontal bottom rails converging forwardly from the rear side frame members and adapted to enter the space defined between the rear side frame members of said like, preceding cart, of a step comprising:

(a) a platform;

(b) a pivot bar secured to the platform and having ends projecting beyond opposite sides of the platform;

(c) means for connecting the projecting ends of the pivot bar to the rear side frame members of the cart, whereby to mount the step for swinging movement between a first, use position in which it projects rearwardly from the rear side frame members for the convenience of a user, and a second, recessed position in which it is swung forwardly into said space a distance less than the extent of the rearward projection of the rear portion of the cart when the same is nested within the preceding cart, said step, in its recessed position, being spaced rearwardly from a similarly recessed step of the preceding cart in the nested relation of the carts sufficiently to prevent the recessed step of said cart from contacting either the preceding cart or the recessed step thereof in such manner as would interfere with the nesting of the carts, said forwardly converging bottom rails providing abutment means limiting the forward swinging movement of the platform beyond the second named position thereof; and

(d) frame elements secured to the platform and adapted to support the platform, when the platform is in its first named position above the floor surface upon which the cart is rollably supported, said frame elements being in the form of metal loops having tread portions that bear frictionally against the floor surface under the weight of the user when the platform is in use as a convenience step, whereby to provide means braking the shopping cart against movement during use of the convenience step.

**4,610,455**

**STEERING SYSTEM FOR FRONT AND REAR WHEELS**

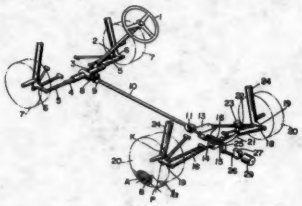
**Yoshimi Furukawa, Saitama, and Shoichi Sano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 5, 1984, Ser. No. 658,190**

**Claims priority, application Japan, Oct. 6, 1983, 58-187600**

**Int. Cl.[4] B62D *7/00***

**U.S. Cl. 280—91** **4 Claims**



1. A steering system for front and rear wheels of a motor vehicle, comprising:

(a) a steering wheel;

(b) front wheels;

(c) first means for steering said front wheels;

(d) rear wheels;

(e) second means for steering said rear wheels;

(f) third means for transmitting the direction and extent of steering of said front wheels to said second means;

(g) fourth means for controlling the steering ratio between said front and rear wheels in response to a signal related to the speed of the motor vehicle, said fourth means including a swing shaft connected to said second means which is vertically movable in response to changes in the vehicle's traveling speed; and

(h) each of said rear wheels having a kingpin having a central line which has an extension which is positioned rearwardly of a point where a vertical line passing through the center of an axle of said rear wheel intersects the ground on which the motor vehicle is disposed.

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**4,610,456**

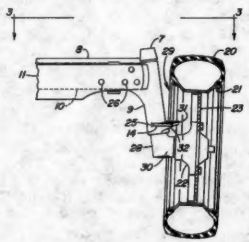
**KNEE MOUNTED SERVICE STEP FOR TWO-WHEEL DRIVE TRACTOR**

**Myron P. Zimmer, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Sep. 9, 1985, Ser. No. 773,485**

**Int. Cl.[4] B60R *3/00***

**U.S. Cl. 280—165** **11 Claims**



1. A service step for a two-wheel drive tractor having a wide front end comprising a front axle with substantially vertical knees attached to each end and each knee pivotally supporting a knuckle and king pin assembly which extends generally outward with respect to the tractor chassis, said knuckle hav-

ing a hub and wheel rotatably mounted thereon, said service step comprising a substantially horizontal surface supported on said knee with said surface: lying below said front axle; above said knuckle; outside a front axle clearance area extending between the knees; out of contact with any portion of said hub, wheel and knuckle in any steering position; and having sufficient area to support a person's foot thereon when said wheel is rotated in a direction away from said surface.

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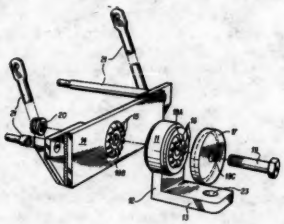
**4,610,457**

## VEHICLE SWIVEL HITCH

**Thomas M. Harmon, 12712 N.E. Hollyhills Dr., Bothell, Wash. 98011**

**Filed Mar. 6, 1985, Ser. No. 709,052**
**Int. Cl.[4] B60D *1/06***
**U.S. Cl. 280—204** **5 Claims**



1. A trailer hitch having a ball-bearing assembly made up of plates, said plates held against balls between said plates by a tightening means, said plates having an axis of rotation around said tightening means wherein the improvement comprises in combination, a first vertical plate of said assembly, vehicle attaching means connected to said first plate, a second vertical plate of said ball-bearing assembly having a member extending in a direction away from said attaching means, said member having a trailer connecting element attached thereto, said trailer connecting element extending from said member in a direction toward the axis of rotation so as to be in line with the axis of rotation, a set of balls located between said two plates, and tightening means securing said two plates against said set of balls and controlling the constraint of rotation, whereby rotational movement in a vertical plane is permitted between a towing vehicle and a trailer attached thereto.

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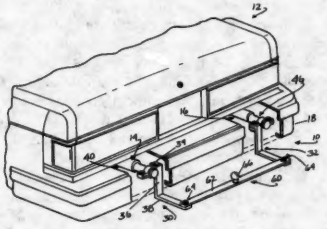
**4,610,458**

## VEHICLE ATTACHABLE CARRIER

**Robert L. Garnham, 38834 Cheviot, Canton Township, Stark County, Mich. 48188**

**Continuation-in-part of Ser. No. 498,118, May 25, 1983, abandoned. This application Feb. 1, 1985, Ser. No. 697,394**
**Int. Cl.[4] B60D *1/06*; B60R *9/06***
**U.S. Cl. 280—495** **12 Claims**



4. An apparatus for mounting an article carrier on a vehicle having a bumper mounted on the vehicle via energy absorbing shock absorbers comprising:

first and second straps, each having a first portion, an integral, depending second portion and an integral, third portion extenidng outward from the second portion opposite and parallel to the first portion;

clamp members, each having a depending central portion respectively secureable to the first portion of the first and second straps such that the first portion of the first and second straps and the depending central portion of the clamp members define apertures for surrounding the energy absorbing bumper shock absorber such that the second portion of the first and second straps extend downward below the bottom of the bumper;

a cross member extending between the first and second straps and carrying an article carrier attachment means thereon rearward of the vehicle bumper;

a plurality of U-shaped straps mounted on the cross member and forming an aperture for sliding receiving the third portions of the first and second straps;

means for securing the third portions of the first and second straps in a pre-determined position on the cross member.

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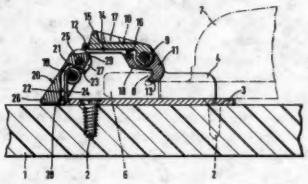
**4,610,459**

## SKI BINDING

**Roland Jungkind, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Metallwerk K. Pittl Ges.mbH & Co. KG, Fulpmes, Austria**

**Filed Jun. 26, 1985, Ser. No. 748,849**
**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438795**
**Int. Cl.[4] A63C *9/18***
**U.S. Cl. 280—615** **10 Claims**



1. A cross-country ski binding for a ski boot having a front extension portion on the sole of the boot, said extension portion being of a stepped configuration to form a retaining means on its top side, comprising a base plate which is to be fixed to the ski and which carries a pair of side jaw members for laterally guiding the front extension portion and to act as a stop means for restricting movement of the ski boot towards the tip of the ski, a horizontal transverse pivot mounting means carried by said side jaw members, a double-armed retaining lever pivotally mounted on said pivot mounting means and having a first arm which faces towards the boot insertion end of the binding and provides a hook means operable to engage the retaining means on the front extension portion of the boot sole, and a second arm, a locking element co-operable with said second arm of said retaining lever to secure same in the position of said retaining lever in which said hook means of said first arm and said retaining means on the front extension portion of the boot sole are interengaged, a spring urging the locking element towards the position of securing said retaining lever in said interengaged condition, and a release member disposed pivotally coaxially with respect to the retaining lever and capable of limited pivotal movement with respect thereto, the locking element having an operative portion co-operable with the release member whereby actuation of the release member causes release movement of the locking element to release said retaining lever, and the retaining lever having an abutment means which extends away from the release member towards said base plate and which is engageable by the front extension

portion of said boot sole upon insertion of the boot into the binding.

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**4,610,460**

## BABY CARRIAGE

**Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan**

**Filed Apr. 19, 1984, Ser. No. 602,161**
**Claims priority, application Japan, May 4, 1983, 58-79804**
**Int. Cl.[4] B62B *7/08***
**U.S. Cl. 280—650** **7 Claims**

1. A baby carriage having a right-hand side and a left-hand side normally spaced from each other by a given width from side to side, comprising a pair of handrails, a pair of front legs respectively turnably attached to relatively front portions of said handrails at respective pivot points, each front leg having a front wheel, a pair of sliders respectively attached to said front legs, so that said sliders are slidable in the direction of the length of said front legs, a pair of rear legs respectively turnably attached to said sliders, each rear leg having a rear wheel, a pair of upper support rods respectively turnably attached at their middle portions to relatively rear portions of said handrails, a pair of lower support rods turnably attached at one of their respective ends to respective middle portions of said rear legs and at their other ends to said upper support rods, a pair of seat support rods turnably attached at their front ends to the respective middle portions of said front legs, said seat support rods having rear ends turnably connected to said upper support rods and said lower support rods approximately where said upper and lower support rods are connected to each other, a pair of pull rods positioned forwardly of said pivot points for connecting said sliders on said front legs to said handrails, and cross-connecting means for connecting said right-hand and left-hand sides of the baby carriage to each other, each side including one front leg, one slider, one rear leg, one upper support rod, one lower support rod, one seat support rod, and one pull rod.

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**4,610,461**

## STEERING SYSTEM FOR ELIMINATION OF BUMP STEERING IN INDEPENDENT WHEEL SUSPENSION SYSTEMS

**Matthew Guzzetta, 7565 North Ave., Lemon Grove, Calif. 92045**

**Filed Jun. 17, 1985, Ser. No. 745,530**
**Int. Cl.[4] B60G *3/20***
**U.S. Cl. 280—660** **11 Claims**

1. An independent suspension for a steerable wheel comprising:

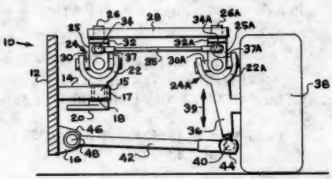
a rotatably positionable steering member;

first and second universal joints each having first and second relatively rotatable elements;

a steering shaft interconnecting said steering member and the center of said first rotatable element of said first universal joint;

a spacer means pivotally attached at one end to the center of the second rotatable element of said first universal joint and pivotally attached at its other end to the center of the first rotatable element of said second universal joint;

steering means connected at one end to the second rotatable element of said first universal joint and connected at its other end to the first rotatable element of said second universal joint;



a steering spindle connected at one end to the second rotatable element of said second universal joint; and

an axle attached to said steering spindle for rotatably supporting said wheel thereon.

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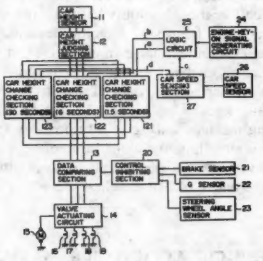
**4,610,462**

## ELECTRONICALLY CONTROLLED SUSPENSION SYSTEM

**Naotake Kumagai, Aichi, and Minoru Tatemoto, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 31, 1984, Ser. No. 636,144**
**Claims priority, application Japan, Aug. 19, 1983, 58-127284[U]**
**Int. Cl.[4] B60G *11/26***
**U.S. Cl. 280—707** **6 Claims**



1. An electronically controlled suspension system comprising: a suspension unit interposed between a wheel and vehicle body of a vehicle and having a vehicle height adjusting fluid chamber, a vehicle height sensor, a vehicle height control section for regulating the supply and discharge of fluid to and from said fluid chamber according to a signal from said vehicle height sensor, a mean vehicle height computing section for calculating the mean value of vehicle height changing over a predetermined mean vehicle height computing time based on the detection signal from said vehicle height sensor, a startup sensing section for outputting a startup detection signal of a given time length from the moment an engine key switch is turned on, a group of actuatable mean vehicle height computing units comprised of a first mean vehicle height computing unit having a first longer computing time suited for computing the mean vehicle height of a travelling vehicle, a second mean vehicle height computing unit having a second computing time shorter than said first computing time and suited for computing the mean vehicle height of a stationary vehicle, and a third mean vehicle height computing unit having a third computing time shorter than said second computing time and suited for

beginning vehicle height adjustment sooner than the usual vehicle height adjustment of the stationary vehicle, a vehicle speed sensor, a travel sensing section for outputting a signal indicative of whether the vehicle is travelling or stationary based on a detection signal from said vehicle speed sensor and operative to actuate only said first mean vehicle height computing unit among said group of mean vehicle computing units when it is sensed from the detection signal from said vehicle speed sensor that the vehicle is travelling, and a computing time reducing section operative to actuate only said third mean vehicle height computing unit among said group of mean vehicle computing units only once after receiving said startup detection signal from said startup sensing section when the signal from said vehicle speed sensor indicates that the vehicle is stationary, and operative to actuate only said second mean vehicle height computing unit among said group of mean vehicle computing units after vehicle height adjustment based on the output from said third mean vehicle height computing unit has been accomplished when the signal from said vehicle speed sensor indicates that the vehicle is stationary.

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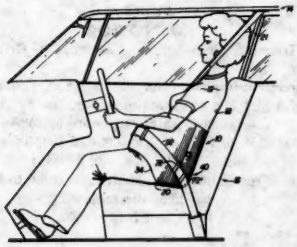
**4,610,463**

## PROTECTION ASSEMBLY FOR ABDOMINAL AREA

**Harriet Efrom, 4533 Adams Ave., Miami Beach, Fla. 33140**

**Filed Dec. 14, 1984, Ser. No. 681,811**
**Int. Cl.[4] B60R *21/04***
**U.S. Cl. 280—751** **14 Claims**



1. A shield assembly of the type primarily designed to protect the abdominal area of a pregnant woman against external forces exerted thereon while seated, said assembly comprising:

(a) a casing formed of a rigid, high resistance material, being configured to include an outward projection and being dimensioned for at least partially surrounding and overlying relation to an abdominal region of a user's body,

(b) attachment means mounted on said casing and structured for removable securement of said assembly on a structure supporting the user,

(c) said casing comprising an outer surface and an inner surface, said outer surface including an overall, generally convex configuration and said inner surface comprising a substantially overall concave configuration, said inner surface disposed in substantially covering and at least partially spaced relation to the abdominal portion of the user,

(d) force directing means secured to opposite longitudinal ends of said casing for transfer of forces exerted on said casing to the supporting structure, and

(e) said force directing means disposed on opposite sides of the user and in abutting, force transferring engagement with surface portions of the supporting structure of the user, and

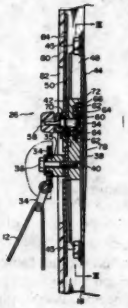
(f) reinforcing means secured to said casing for strengthening thereof and disposed to extend along the length of said casing and terminate adjacent said opposite longitudinal ends of the casing.

**4,610,464**

## SHOULDERBELT ANCHOR DEVICE

**Jun Yasumatsu; Masanao Motonami, and Makoto Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Continuation of Ser. No. 423,298, Sep. 24, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 679,103**
**Claims priority, application Japan, Aug. 11, 1982, 57-139349**
**Int. Cl.[4] B60R *21/10***
**U.S. Cl. 280—808** **9 Claims**



1. A shoulder belt anchor device for securing an occupant's shoulder restraining webbing to a vehicle body, comprising:

a guide rail secured to a side wall of the vehicle body, said guide rail having a longitudinal axis and side walls along its longitudinal direction;

a sliding anchor having an anchor blook and being movable along said guide rail in its longitudinal direction, said sliding anchor being secured with a shoulder anchor engaged with said webbing, the anchor block having a first layer and a second layer, an opening being provided in one of said first and second layers;

a lock member rotatably positioned within said opening, said lock member being substantially coplanar with said one of said first and second layers;

lock means for anchoring said sliding anchor at a selected position along said guide rail, said lock means including a pair of lock bars pivotally connected to said lock member and a plurality of engaging holes formed in the side walls of said guide rail in the longitudinal direction thereof, said guide rail being capable of receiving said lock bars through said engaging holes so that said sliding anchor is prevented from moving when said lock bars are engaged with said engaging holes;

guide means for guiding said lock bars in directions opposite to each other, said guide means including passages formed in the layer of said anchor block opposite from the layer in which said opening is located;

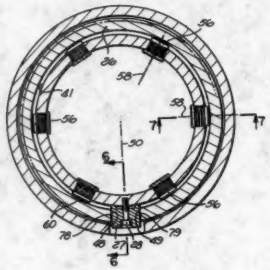
biasing means for biasing said lock member to urge said lock bars through said guide means in a direction of said engaging holes; and

releasing means secured to said lock member for withdrawing the lock bars from said engaging holes against the biasing force of the biasing means, whereby said sliding anchor is moved along said guide rail to provide an adjustable anchor point for the webbing.

## 4,610,465
## STRUCTURE AND USE OF REMOTELY RELEASABLE PILE CONNECTORS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Oct. 19, 1983, Ser. No. 543,518
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—3 28 Claims

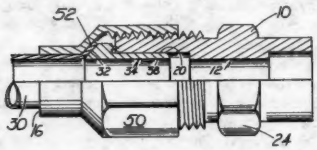


1. A joint comprising:
a tubular box section;
a pin section adapted to project into said box section;
a locking structure which is generally annular but has an interruption and is adapted to be expanded from a reduced diameter condition to an increased diameter condition;
said sections having means coacting with said locking structure to block relative movement of the sections axially apart in said increased diameter condition of the locking structure while permitting axial separation of the sections in said reduced diameter condition of the locking structure;
a retaining member which is receivable in a locking position within said interruption in a relation holding said locking structure in said increased diameter condition, and is displaceable from said locking position to enable constriction of the structure to said reduced diameter condition and thereby permit separation of the sections; and
means operable by pressure fluid to expand said locking structure from said reduced diameter condition to said increased diameter condition.

## 4,610,466
## CONVERTIBLE FLARE/BRAZE FITTING

Linda L. Geer, Jackson, and Steven M. Knowles, Cement City, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Continuation of Ser. No. 507,038, Jun. 23, 1983, abandoned.
This application Aug. 1, 1985, Ser. No. 761,663
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—12 2 Claims

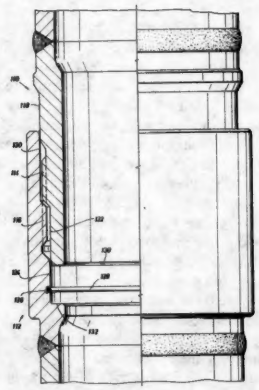


1. In combination, a fitting comprising a body having a cylindrical passage, a passage axis, a flat planar end intersected by said passage perpendicular thereto, and threads defined upon the body adjacent said end and coaxial with said passage, a cylindrical counterbore defined in said body concentric to said passage and forming a portion thereof, said counterbore directly intersecting said body end and comprising an inner cylindrical surface of uniform diameter throughout its length, a tubular insert within said counterbore having an external cylindrical surface of a diameter slightly less than the diameter of said counterbore inner surface whereby said insert is axially displaceable within said counterbore, said insert including a radially extending flange substantially perpendicularly disposed to said body passage axis located adjacent said body end exteriorly of said counterbore and having a periphery having a diameter greater than the diameter of said insert cylindrical surface and less than the minimum diameter of said threads, an outer conical sealing surface defined on said insert flange converging toward said passage axis in a direction away from said body end adapted to be engaged by a conduit flare, said flange outer conical sealing surface intersecting said flange periphery, an inner annular radial shoulder defined on said flange in axial opposed relation to said body end, an annular ridge homogeneously defined upon said inner flange shoulder concentric to said insert cylindrical surface and radially spaced outwardly therefrom radially located between said insert external cylindrical surface and said flange periphery, said ridge having a sharp apex to facilitate embedding of said ridge into said body end, and an annular nut threaded upon said body threads adapted to circumscribe the flared end of a conduit located upon said conical sealing surface and axially displace said insert into said counterbore to embed said ridge apex into said body end.

## 4,610,467
## CONNECTOR

Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 577,532, Feb. 6, 1984, abandoned, which is a continuation of Ser. No. 373,114, Apr. 29, 1982, Pat. No. 4,429,904, which is a continuation-in-part of Ser. No. 280,302, Jul. 6, 1981, Pat. No. 4,410,204. This application Jul. 10, 1984, Ser. No. 629,341
The portion of the term of this patent subsequent to Feb. 7, 2001, has been disclaimed.
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—24 73 Claims



43. A connector assembly comprising:
a. a first connector member including a first guide section and a second guide section axially displaced from, and of generally lesser external lateral dimension than, said first guide section;
b. a second connector member for receiving said first connector member, including a first receptacle, for receiving said first guide section, and a second receptacle, for re-

ceiving said second guide section, axially displaced from and of generally lesser internal lateral dimension than said first receptacle;

c. continuous, straight, external threads, as part of said first member, positioned generally axially between said first and second guide sections;

d. continuous, straight, internal threads, as part of said second member, positioned generally axially between said first and second receptacles and generally complementary to said external threads for threaded engagement therewith; and

e. first and second abutment means carried by said first and second members, respectively, whereby said first and second members may be completely connected with said first and second abutment means in mutual abutting engagement and with said external and internal threads loaded;

f. wherein said first and second guide sections may be partially received by said first and second receptacles, respectively, to align said first and second members without threaded engagement between said external and internal threads.

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**4,610,468**

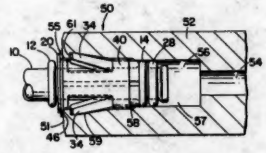
## QUICK CONNECT/DISCONNECT COUPLING

**Richard D. Wood, Columbia City, Ind., assignor to United Technologies Automotive, Inc., Dearborn, Mich.**

**Filed Aug. 14, 1984, Ser. No. 640,740**

**Int. Cl.[4] F16L *35/00***

**U.S. Cl. 285—81** **7 Claims**




1. A plug and socket coupling for use with fluid carrying members which comprises:

a socket defining a central cavity including a fluid flow outlet and a portion for receiving the plug, said portion including a radially extending contact face;

a plug assembly including a tube, a retainer with radially outwardly projecting flexible legs mounted about the tube and a sleeve mounted about the retainer sized to be able to slide over and compress the retainer legs, and means limiting axial movement of said retainer relative to said tube said plug assembly being sized to fit within the socket central cavity such that the projecting retainer legs engage the contact face to prevent removal of the plug assembly from the socket and such that the retainer may be displaced relative to the sleeve to cause the sleeve to compress the retainer legs radially inwardly to allow removal of the plug assembly from the socket; and

sealing means extending between the socket and the plug assembly to effect a seal therebetween.

**4,610,469**

## CONNECTOR ASSEMBLY FOR STERILE CONNECTION OR TWO INTERNALLY STERILE CONTAINERS OF TUBINGS

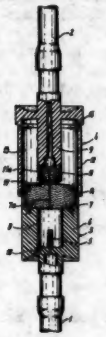
**Marcelle N. Wolff-Mooij, Ridderkerk, Netherlands, assignor to Steritech B.V., Ridderkerk, Netherlands**

**Filed Jan. 31, 1984, Ser. No. 575,325**

**Claims priority, application Netherlands, Feb. 2, 1983, 8300386**

**Int. Cl.[4] F16L *31/00***

**U.S. Cl. 285—260** **9 Claims**



1. In a connector assembly for sterile connection of two internally sterile containers or tubings, comprising:

a first connector having a male part inside a housing, a connecting device to connect said first connector to a first container or tubing, and a first deformable barrier spaced from the male part to define a chamber between said male part and said first barrier, and

a second connector having a female part, a connecting device to connect said second connector to a second container or tubing, and a second deformable barrier closing the female part,

wherein by connecting said first and second connectors, both of said deformable barriers are brought into contact with each other so that the male part of the first connector is pushed through the second barrier, closing the female part of the second connector,

the improvement wherein said second barrier is mounted in the female part so that said second barrier is pushed entirely through said first barrier during the connection of said first and second connectors, and into the chamber between said male part and said first barrier, before the male part can penetrate said second barrier, and wherein at least the second barrier is comprised of a resilient material which during disconnection of said first and second connectors is restored in said chamber in the original, closing condition.

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**4,610,470**

## CONDUIT COUPLING

**Neill D. Perrine, and Paul J. E. Fournier, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.**

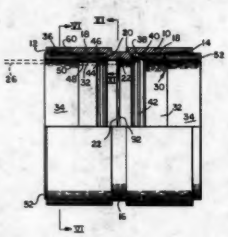
**Filed Aug. 6, 1984, Ser. No. 638,067**

**Int. Cl.[4] F16L *21/04***

**U.S. Cl. 285—321** **4 Claims**

1. A fitting for rigid conduit having cylindrical ends comprising, in combination, a body having a flow passage having an axis and an internal cylindrical surface intersecting an open end, seal structure within said flow passage adjacent said open end adapted to circumscribe a conduit inserted into said body open end, said seal structure including an abutment defined within said body axially spaced from said open end, an annular

elastomeric seal operatively restrained against axial displacement by said abutment, an annular compression ring axially displaceable within said flow passage to compress said seal to radially expand said seal inwardly to seal and frictionally grip a conduit therein, ring retaining means interposed between said ring and body preventing axial displacement of said ring away from said seal upon a predetermined axial position of said ring being attained, said ring retaining means including first and second ring retaining elements, said first elements retaining said ring and seal assembly at a first axial position within said flow passage prior to compression and expansion of said seal, said second elements maintaining positioning of said compression ring at a second axial position during compression and expansion of said seal, abutment means defined on said body, an annular circumferential groove defined in the circumference of said compression ring axially defined by radial shoulders, an annular recess defined within said body cylindrical



surface adjacent said open end having a radial shoulder facing said abutment and defining said abutment means, said ring retaining means comprising an annular band received within said groove having an axial width substantially equal to the groove axial dimension, a plurality of first, second and third cantilevered teeth defined on said band circumferentially spaced thereabout and each having free ends, said first and second teeth free ends having a normal position radially outwardly disposed of the annular configuration of said band, whereby insertion of said ring into said body open end biases said first and second teeth free ends into said groove due to engagement with said cylindrical surface, said first teeth comprising said first elements and the free ends thereof aligning with said recess shoulder at said first ring position, said second teeth comprising said second elements and the free ends thereof aligning with said recess shoulder at said second ring position.

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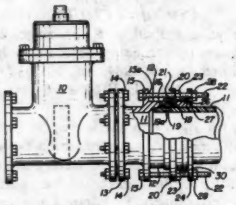
**4,610,471**

## FLANGE ADAPTERS

**Richard M. Halen, Pittsburgh, and Robert B. Walsh, Sweet Valley, both of Pa., assignors to Coupling Systems, Inc., Pittsburgh, Pa.**

**Filed Oct. 29, 1985, Ser. No. 792,445**
**Int. Cl.[4] F16L *21/02***
**U.S. Cl. 285—337** **9 Claims**



1. A flange adaptor for connecting a flanged valve end to a plain ended plastic pipe end or the like comprising an elongate generally cylindrical member having a bore lengthwise thereof, a radial outward flange at one end of said cylindrical member for attachment to a flanged end of a valve to be connected to a plastic line or the like, a second radial outward flange intermediate the ends of said member, an enlarged cylindrical bore at the other end of said cylindrical member for receiving the end of a plastic pipe to be connected, said enlarged bore having a generally frusto conical end portion opening outwardly, an annular elastomeric gasket adapted to slidably and snugly fit over the end of said plastic pipe and having a generally frusto conical end portion adapted to fit into the frusto conical opening of said bore, a follower member bearing on said gasket to force said gasket into said bore, an annular sleeve on said follower member extending over said gasket and containing said gasket against radial expansion, tightening means between the follower member and said second flange acting on the follower member to move said follower member axially toward the valve body to force said gasket into sealing engagement with the bore and plastic pipe end, a back up ring adjacent said follower having a frusto conical opening surrounding said plastic pipe, a compressible frusto conical jaw means in said opening in the back up ring surrounding and engaging the plastic pipe end, surface engaging means on said jaw means engaging said plastic pipe against axial movement and auxiliary tightening means between said second flange, the follower and the back up ring drawing the back up ring axially toward the follower and compressing the jaw means radially inwardly into engagement with the plastic pipe.

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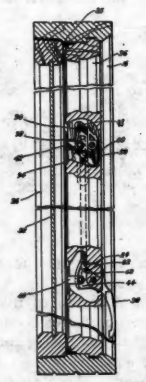
**4,610,472**

## LOCK FOR CASEMENT WINDOWS

**Michael J. Billingsley, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa**

**Filed Nov. 3, 1982, Ser. No. 438,784**
**Int. Cl.[4] E05C *3/04***
**U.S. Cl. 292—54** **8 Claims**



1. In a casement window having a frame including first and second spaced frame jambs, a head and a sill, and a sash including spaced sash sides and spaced sash ends about a sash panel, said sash being hinged to said first frame jamb for opening and closure, an improved casement window securement mechanism, comprising:

a first sash catch on one of said sash sides;

a second sash catch on said one sash side and being spaced apart from said first sash catch;

a first cam rotatably mounted on said second frame jamb and being positioned for operative cooperation with said first sash catch during closure;

a second cam rotatably connected to said second frame jamb and being positioned spaced from said first cam for operative cooperation with said second sash catch during closure;

an elongated linkage arm connecting said second cam to said first cam for rotating said second cam in response to rotation of said first cam;

means for momentarily delaying the initial rotation of said second cam until after commencement of rotation of said first cam whereby said second cam remains motionless after said first cam has begun rotation to catch said first sash catch and draw the window closer to a closed position, thereby positioning the second catch within reach of the second cam.

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**4,610,473**

## HEAD AND METHOD FOR ORIENTING ELECTRICAL COMPONENTS

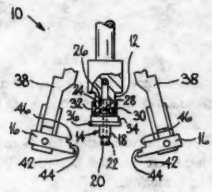
**Victor T. Hawkswell, Witham, England, assignor to Emhart Corporation, Hartford, Conn.**

**Filed Mar. 4, 1985, Ser. No. 707,853**

**Claims priority, application United Kingdom, Mar. 8, 1984, 8406129**

**Int. Cl.⁴ B65G *47/91***

**U.S. Cl. 294—64.1** **6 Claims**




1. An electrical component pick-up system for use within a component placement machine wherein various sizes of electrical components are to be picked up from one or more supply sources and placed on substrates, said system comprising

a plurality of means for picking up components of different sizes, each of said pick-up means having a datum face located thereon which contacts the component to be picked up, said datum face having the same peripheral shape as the component size that is to be picked up, said datum face furthermore having peripheral face dimensions slightly larger than the corresponding peripheral dimensions of the component size to be picked up;

means for operatively holding one of said plurality of pick-up means at any one time whereby the thus held pick-up means is operative to pick-up a component and thereafter place the component, said holding means including means for receiving a different pick-up means for picking up a different size of component; and

at least one pair of opposing jaws, each jaw having at least one orienting face disposed to cooperate with a corresponding orienting face of the other jaw as the jaws are moved toward each other whereby each orienting face engages a corresponding peripheral edge of a particularly held pick-up means employed for picking up a particular component size so that the particular component size is oriented with respect to the datum face upon engagement of the orienting faces of said pair of jaws with the corresponding peripheral edge of the particular pick-up means.

**4,610,474**

## LIFEBOAT RELEASE HOOK

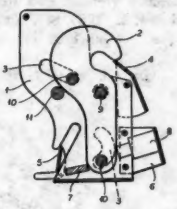
**Jari Jaatinen, Turku, Finland, assignor to Oy Fiskars Ab Veneveistamo, Turku, Finland**

**Filed Feb. 21, 1985, Ser. No. 703,931**

**Claims priority, application Finland, Feb. 22, 1984, 840719**

**Int. Cl.⁴ B63B *23/58*; B66C *1/36***

**U.S. Cl. 294—82.27** **2 Claims**




1. A lifeboat hook assembly which comprises:

a pair of plates adapted to be affixed to a lifeboat;

a hook received between said plates, said plates being provided with spaced apart pairs of guide slots;

respective guide pins affixed to said hook and each engaging in a pair of slots of the two plates for guiding said hook between a loop-engaging loaded position and a loop-releasing disengaged position;

a stop affixed to said plates cooperating with an upper end of said hook for said loop-engaging loaded position for retaining a loop from which the lifeboat may be suspended in said hook, said hook moving away from said stop into said loop-releasing position for disengagement from said loop;

a locking pin displaceable perpendicularly to said plates and mounted on at least one of said plates for releasable engagement with said hook when said hook is in said loop-engaging loaded position for retaining said hook in said loop-engaging loaded position under loading caused by suspension of the life boat from the loop; and

a hydraulic piston-and-cylinder unit mounted on said plates and actuatable to brace against a lower portion of said hook for releasably retaining same in said loop-engaging loaded position upon withdrawal of said locking pin from engagement with said hook, whereby depressurization of said unit enables loading of said hook to cause its displacement between said loop-engaging loaded position and said loop-releasing position.

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**4,610,475**

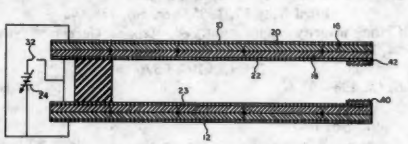
## PIEZOELECTRIC POLYMER MICROMANIPULATOR

**David L. Heiserman, Columbus, Ohio, assignor to Microflex Technology, Inc., Columbus, Ohio**

**Filed Sep. 6, 1984, Ser. No. 647,722**

**Int. Cl.⁴ B25J *15/12***

**U.S. Cl. 294—86.4** **12 Claims**




1. An apparatus for grasping and releasing an object, the apparatus comprising at least two jaw members mounted to a support, at least one of the jaw members comprising a piezoelectric polymer and having means for applying an electric field to the piezoelectric polymer and for controlling said field

whereby changes in the field cause changes in the mechanical strain of the polymer to move a portion of the polymer with respect to the other jaw member and thereby provide a gripping and releasing movement.

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**4,610,476**

## CARRYING STRAP MOUNTING

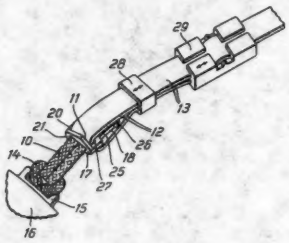
**Heinz Keiner, Solms, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany**

**Filed Jun. 22, 1984, Ser. No. 623,458**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 8318443[U]**

**Int. Cl.[4] A63C *11/02***

**U.S. Cl. 294—149** **11 Claims**




1. A carrying strap mounting for the releasable fastening of a first terminal loop of a carrying strap to a mounting lug on an object to be carried, comprising:

a one-piece fastening element having an opening for removably receiving the first loop of the carrying strap;

a second flexible cord attached to one end of the fastening element and adapted to be connected at the other end with the mounting lug;

a slideable locking member disposed around the carrying strap and being adapted to cooperate with said fastening element when slid thereover to secure the strap within said opening in the fastening element; and

wherein the fastening element comprises an essentially rigid base member, including means for attaching the second cord loop, and two elastic legs attached in spaced relationship to said base member to form a generally U-shaped configuration, wherein the legs are angled in the area of the base member to form an opening for accepting the first loop of the carrying strap.

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**4,610,477**

## BRACKET FOR SUN VISOR FOR AUTOMOTIVE VEHICLES WITH MEANS FOR EXCLUDING MOLDING FOAM

**Charles Ebert, Luxeuil, France; Lothar Viertel, Berus, Fed. Rep. of Germany; René Lecorvaisier, Hombourg-Haut, France, and Joseph Menschaert, Haaltert, Belgium, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany**

**Filed May 17, 1985, Ser. No. 735,445**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440976**

**Int. Cl.[4] B60J *3/02***

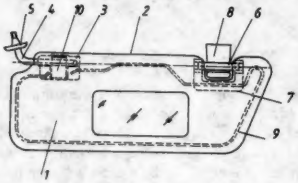
**U.S. Cl. 296—97 K** **20 Claims**

1. A sun visor for automotive vehicles, comprising:

a sun visor body;

a mounting bracket attached to the sun visor body, the mounting bracket defining an insertion opening for supporting a shaft therein; and

an extension which is integral with and extends from the mounting bracket at a region thereof which defines one end of the insertion opening and the extension surrounding the periphery of the opening, the integral extension protruding out of the sun visor body, whereby the insertion opening is effectively covered against entry of material by the extension; the extension being separable from the mounting bracket.

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**4,610,478**

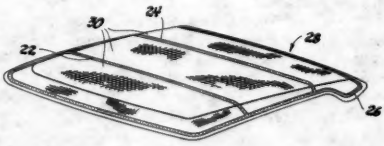
## FIBERGLASS HEADLINER WITH INTEGRAL ROOF BOWS AND ROOF RAILS

**Steven A. Tervol, Drayton Plains, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 1, 1984, Ser. No. 585,157**

**Int. Cl.[4] B60J *7/00***

**U.S. Cl. 296—214** **3 Claims**




1. An automotive headliner panel of molded fiberglass and resin having integral reinforcing roof bows and roof rails comprising,

a network of resin bonded glass fibers that defines the panel wherein there are spaces between fibers such that the panel is air permeable,

a plurality of integral roof bows extending transversely of the panel between the edges thereof,

a roof rail extending along the edges of the panel and connecting the roof bows,

said reinforcing roof bows and roof rail being formed by saturating selected localized areas of the resin bonded fibrous network with additional resin to a predetermined depth and width and curing the additional resin.

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**4,610,479**

## CHAIR WITH RAISABLE SEAT, PARTICULARLY FOR THEATERS

**Claude Pouzoulet, Le Raincy, France, assignor to Quinette International S.A., Montreuil, France**

**Filed Mar. 5, 1985, Ser. No. 708,621**

**Int. Cl.[4] A47C *1/121***

**U.S. Cl. 297—332** **7 Claims**

1. A theater chair, comprising:

(a) an upstanding support member (2) having a lower portion adapted to be fixed to a floor,

(b) a mounting unit (3) having an upwardly open U-shaped profile defined by a front limb (3*a*) having an upper edge, a rear limb (3*b*), and a central web (3*d*) connecting said limbs together and fixed to an upper portion of the support member,

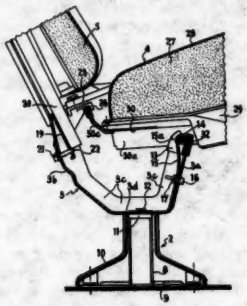
(c) a backrest (5) mounted to the rear limb,

(d) a seat (4),

(e) hinge means mounting a rearward portion of the seat to the front limb about a hinge axis (32*b*) spaced inwardly from a rear edge of the seat such that a rearwardly over-

hanging portion of the seat is received between the mounting unit limbs when the seat is in a raised position,

(f) a lever-forming member (**32***a*) fixed to the seat and disposed parallel to the hinge axis, and



(g) a leaf spring (**15**) fixed to the front limb and defining a latching portion (**15***a*) disposed at the level of the upper edge of the front limb and engaging the lever-forming member to urge the seat towards its raised position.

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**4,610,480**

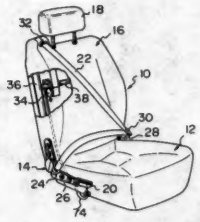
## BUILT-IN TYPE SAFETY SEAT BELT SYSTEM FOR RECLINING VEHICLE SEAT

**Hisao Yamada, Aichi; Toshiaki Shimogawa; Teruhiko Koide, both of Okazaki, and Masahiro Iwatsuki, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Niwa, both of, Japan**

**Filed Feb. 22, 1985, Ser. No. 704,590**

**Int. Cl.**[4] **A62B** *35/02*

**U.S. Cl. 297—478** **6 Claims**



1. A built-in-type safety seat belt system for use with a reclining vehicle seat having a seat backrest, with a frame, hinged for tilting movement to a seat cushion for adjustment of the angle thereof, which comprises:

(a) a support horizontally extending within said seat backrest and rigidly secured to said backrest frame for movement therewith;

(b) an emergency-locking-type seat belt retractor (ELR) housed within said seat backrest and having an inertial mass operable to lock the retractor in an emergency situation of the vehicle, said retractor being mounted for rotation on said horizontal support in such a manner that said retractor as a whole is moved under the action of gravity into a substantially vertical position wherein said inertial mass is held substantially in an inoperative position whatever the angle of the seat backrest;

(c) a seat belt having one end anchored to a point on said seat remote from the upper region of the backrest, said seat belt having a section extending in front of and across the seat backrest from said anchored point to the upper region of the backrest to form at least a shoulder belt section, said seat belt having a section extending into the interior of said seat backrest through said upper region thereof, the other end of said seat belt being retractably connected to said retractor within said backrest;

(d) means for releasably locking said retractor with respect to said horizontal support to prevent rotation of the retractor about said support; and

(e) manually-operated actuating means for selectively releasing said locking means to permit said retractor to rotate about said support, whereby said retractor swings into an angular position such that said inertial mass is held in said inoperative position when said seat backrest is tilted.

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**4,610,481**

## APPARATUS FOR REPLENISHING THE SUPPLIES OF BRISTLES IN THE MAGAZINES OF BRUSH MAKING MACHINES

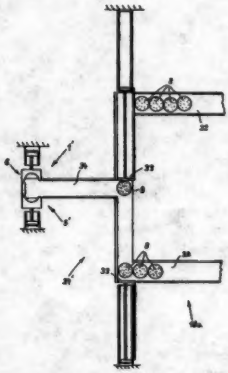
**Walter Steinebrunner, Todtnau, Fed. Rep. of Germany, assignor to Anton Zahoransky, Todtnau, Fed. Rep. of Germany**

**Filed Nov. 15, 1984, Ser. No. 672,100**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1983, 3343071; Jan. 21, 1984, 3402050**

**Int. Cl.**[4] **A46D** *1/04*

**U.S. Cl. 300—21** **22 Claims**



1. Apparatus for replenishing a supply of at least substantially parallel bristles in a brush making machine, comprising at least one source of batches each of which contains parallel bristles and is surrounded by an envelope; means for partially removing the envelopes from successive batches so that portions of the respective batches become exposed; means for grasping the exposed portions of successive batches; and means for transferring the thus grasped batches away from said removing means while the latter continues to hold the envelopes so that the batches become fully separated from the respective envelopes.

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**4,610,482**

## VEHICLE WHEEL WITH DISC FORMING OUTER TIRE RETAINING FLANGE

**Joseph C. Overbeck, East Lansing; Garth D. Lawrence, Laingsburg, and John H. Golata, Lansing, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.**

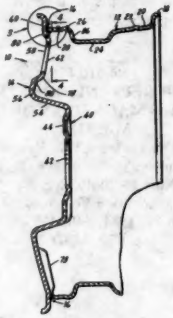
**Filed Mar. 7, 1985, Ser. No. 709,660**

**Int. Cl.**[4] **B60B** *3/02*

**U.S. Cl. 301—63 R** **16 Claims**

1. In an automotive passenger vehicle wheel construction having a disc fabricated from sheet metal and including a central bolt circle mounting portion, an intermediate portion

extending generally radially outwardly from said bolt circle mounting portion and an outer peripheral portion surrounding said intermediate portion, said disc outer peripheral portion being formed to provide an outboard tire bead retaining flange for said wheel, and a rim part including an inboard tire bead retaining flange, an inboard tire bead seat portion, a drop-center well portion and an outboard bead seat portion, the improvement wherein the outboard edge of said rim part comprises a radially in-turned rim edge flange portion extending circumferentially continuously around the rim edge adjacent



said rim outboard bead set, said rim edge flange having a radially extending abutment surface at the outboard extremity thereof, said disc outboard flange having a radially extending rim mating surface disposed in abutment with said rim edge abutment surface, said rim edge flange having a radially inwardly sloping surface extending between said rim outboard bead seat and said rim edge abutment surface and defining with said disc outboard flange a trench disposed radially inwardly of said rim outboard bead seat, said rim and disc parts being permanently joined by a circumferentially continuous weld formed in said trench.

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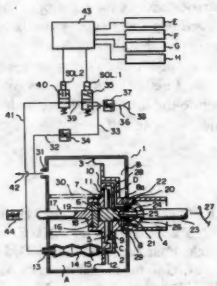
**4,610,483**

## VEHICLE BRAKE SYSTEM

**Yukio Matsumoto, and Toshio Takayama, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan**

**Filed May 20, 1985, Ser. No. 736,121**
**Claims priority, application Japan, May 18, 1984, 59-100308**
**Int. Cl.[4] B60T *8/74***
**U.S. Cl. 303—97** **1 Claim**



1. A vehicle brake system including a force multiplier apparatus which includes a shell body, a power piston displaceably mounted in the shell body through a diaphragm, a control chamber defined in the power piston, a partition wall means displaceably mounted in the control chamber to define two control chambers, said power piston defining within the shell body a front chamber and a rear chamber, and a valve mechanism in said power piston which cooperates with an input member to control pressure between said chambers, whereby when a pressure difference is produced in said front and rear chambers by operating the input member, a thrust is produced in the power piston which is transmitted to an output shaft, and the reaction force produced in the output shaft is transmitted to the input member, said system further comprising a controller operatively connected to a vehicle speed sensor, an acceleration switch, a manual brake switch and, change-over valve means, said change-over valve means cooperating with said input member to increase, maintain, and decrease force by controlling introduction of atmospheric air or negative pressure into one of the control chambers defined in said power piston, the other control chamber communicating with said front chamber in said shell body which is connected with said negative pressure, said controller controlling said change-over valve means under specified conditions, said controller comprising a deceleration calculating circuit for calculating the amount of deceleration of the vehicle, a timer which is actuated when said manual brake switch is ON and which determines the operation timing of said deceleration calculation circuit, a comparator circuit for comparing the output of said deceleration calculating circuit with predetermined values so as to judge the operating condition of the vehicle, and a command signal transmitting circuit for producing brake force increase, maintain and decrease signals corresponding to the vehicle operating conditions judged by the comparator circuit.

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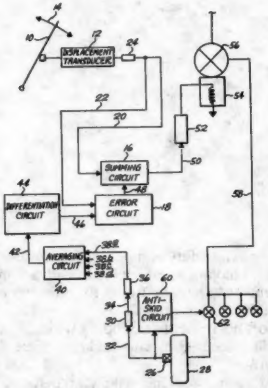
**4,610,484**

## DECELERATION CONTROL BRAKE SYSTEM

**Robert L. Amberg, Seattle, and Jerome C. Rosenberg, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 23, 1983, Ser. No. 535,389**
**Int. Cl.[4] B60T *8/02***
**U.S. Cl. 303—100** **15 Claims**




1. A braking system, comprising:
wheel means;
hydraulic brake means on said wheel means;
conduit means for delivering a hydraulic operating fluid to the hydraulic brake means;
a pressure control valve in the conduit means for regulating the pressure of the hydraulic operation fluid delivered to the brake means for adjusting and controlling deceleration of the wheel means, the valve including an electrical operator which adjusts the valve;
a foot pedal;

a first transducer connected to the foot pedal for producing a first electrical signal indicative of pedal displacement, the tranducer being connected to the electrical operator in a manner so that the first signal is transmitted to the electrical operator for controlling deceleration of the wheel means in response to foot pedal displacement;

a second transducer connected to the wheel means for produced a second electrical signal indicative of wheel means deceleration during braking; and

control circuit means including summing circuit means and error circuit means, said error circuit means being operatively connected to said first and second transducers for receiving both the first signal indicating foot pedal displacement and the second signal indicating wheel means deceleration, wherein the error circuit means compares both of such signals to determine if wheel means deceleration is substantially directly proportional in response to foot pedal displacement, and wherein the error circuit means generates an error signal if the wheel means deceleration is not substantially proportional to foot pedal displacement, and further, said summing circuit means being operatively connected to said error circuit means so as to receive any generated error signal therefrom, and with said summing circuit means being operatively positioned between said first transducer and said electrical operator to receive the first signal, and to adjust the first signal by using the error signal if generated, and to transmit the adjusted signal to the electrical operator in a manner for operating the pressure control valve to regulate hydraulic fluid pressure to the brake means during braking to produce wheel means deceleration which is substantially directly proportional to foot pedal displacement.

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**4,610,485**

## ANTILOCK SYSTEM FOR AIR BRAKE SYSTEM

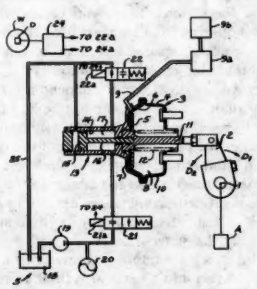
**Namio Watanabe, Menuma, Japan, assignor to Akebono Brake Industry Company Ltd., Tokyo, Japan**

**Filed May 30, 1984, Ser. No. 615,358**

**Claims priority, application Japan, Jun. 3, 1983, 58-99136**

**Int. Cl.[4] B60T *8/44;* F16D *55/22***

**U.S. Cl. 303—114** **5 Claims**



1. In an antilock air brake system including a brake mechanism for applying and releasing a braking force comprising a brake arm, a brake system actuator having an input member, means for selectively pressurizing pneumatic fluid, said brake arm being connected to the input member of the air brake system actuator, an actuator rod connected to said brake arm, and a pneumatic actuator defining a high pressure portion and a low pressure portion for reciprocatively moving said actuator rod, the improvement comprising:

a hydraulic cylinder mechanism disposed adjacent to said pneumatic actuator, said hydraulic cylinder mechanism having a reciprocably movable piston connected to one of (a) said actuator rod and (b) said brake arm; and

hydraulic pressure means for providing hydraulic pressure to said hydraulic cylinder mechanism in response to a control signal resulting from a locked state of a wheel to move said brake piston against the air pressure of said pneumatic actuator so as to move said brake arm against the action of said high pressure portion of the pneumatic actuator.

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**4,610,486**

## STRUCTURAL BEARING ASSEMBLY

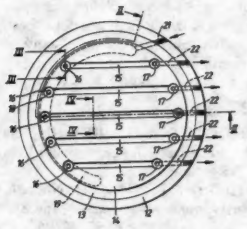
**Maurice G. Baigent, Ilminster, England, assignor to Aeplc, England**

**Filed Mar. 28, 1985, Ser. No. 716,856**

**Claims priority, application United Kingdom, Mar. 30, 1984, 8408248**

**Int. Cl.[4] F16C *29/02, 33/10;* E01D *19/06***

**U.S. Cl. 384—7** **17 Claims**



1. A structural bearing assembly comprising: support means, a bearing surface on said support means, said bearing surface being formed by a layer of a bearing material capable of cold flow under loads for which the bearing is designed, a contact plate in engagement with said bearing surface thereby defining the sliding surfaces of said bearing assembly, said bearing surface of said bearing material being the only load supporting surface contacting said contact plate; said bearing surface being interrupted by a series of elongate channels, each of said channels having an opening at each end for the introduction and removal of a lubricant material, means occupying each of said channels, each of said means having a base portion and upstanding side portions, said base portion and said side portions being formed of a material which is harder than that of said bearing surface and capable of resisting any cold flow lateral pressure exerted there against.

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**4,610,487**

## DRAWER SLIDE WITH LOCK

**Dale Delmege, Santa Fe Springs, and Richard O. Rask, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.**

**Filed Sep. 16, 1985, Ser. No. 776,409**

**Int. Cl.[4] F16C *29/04***

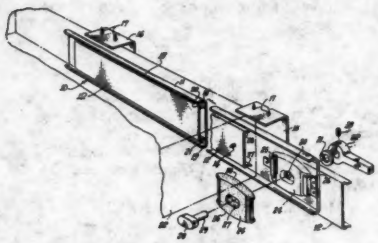
**U.S. Cl. 384—18** **11 Claims**

1. An improved drawer slide of the type having an outer slide member having a longitudinal axis and a pair of inwardly-facing, ball-bearing supporting grooves, an inner slide member positioned within said outer slide member, said inner slide member having a pair of outwardly-facing, ball-bearing supporting grooves, a plurality of ball bearings held between said pair of grooves on said outer slide member and said pair of grooves on said inner slide member, said ball bearings being positioned by a ball retainer, wherein the improvement comprises:

a deformable brake block held on said outer slide member and shaped so that said inner slide member may pass freely over said block when said brake block is not deformed, said brake block having an opening therein;

a movable cam member held by said outer slide member and positioned within said opening in said brake block, said

cam member being shaped so that it does not deform said brake block sufficiently to contact said inner slide member when it is in a first position and so that it deforms said



deformable brake block so that it does contact said inner slide member when it is in a second position; and

means to move said cam member between said first and second position.

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**4,610,488**

**LINEAR MOTION BALL BEARING STRUCTURE**

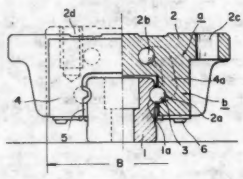
**Toshiaki Geka, Funabashi, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan**

**Filed Dec. 26, 1984, Ser. No. 686,130**

**Claims priority, application Japan, May 31, 1984, 59-109573**

**Int. Cl.[4] F16C *29/06***

**U.S. Cl. 384—45** **6 Claims**




1. A linear motion bearing structure for allowing a first member having a pair of first vertical walls spaced apart from each other to move along a second member having a pair of second vertical walls each of which faces opposite to the corresponding one of said pair of first vertical walls and each of which is provided with at least one straight guide groove, comprising:

endless path means defined in said first member for each of said at least one straight guide groove, said endless path means including a load path section defined in the corresponding one of said first vertical walls and located between the top and bottom of said first vertical walls and in parallel with said straight guide groove, a return path section located above and inward of said load path, and a pair of connection path sections each connecting the corresponding ends of said load and return path sections and including a pair of curved portions, which extend as curved radially outwardly with respect to a longitudinal axis of said first member from the respective corresponding ones of said load and return path sections to respective outward points, and an intermediate portion which extends between said respective outward points; and

a plurality of rolling means provided in said endless path means, said rolling means being capable of rolling along said endless path means as said first member moves along said second member, whereby said rolling means are placed in rolling contact between said first and second members while moving through said load paths section.

**4,610,489**

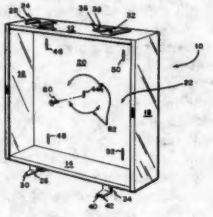
**MEDICINE CABINET ASSEMBLY AND METHOD OF MOUNTING SAME**

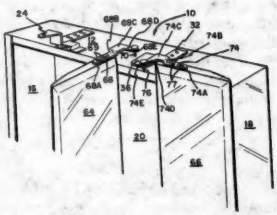
**Grant Dibert, Jr., Ft. Thomas, and David Shelton, Union, both of Ky., assignors to Kent Subsidiary of Kidde Inc., Bellevue, Ky.**

**Filed Mar. 6, 1985, Ser. No. 708,789**

**Int. Cl.[4] A47B *67/00*; A47G *1/16*; E05D *7/10*; B23P *11/00***

**U.S. Cl. 312—227** **2 Claims**





1. A method of installing a medicine cabinet having a cabinet body formed of top, bottom, side and rear surfaces; first and second body hinge leaves secured to the top and bottom surfaces of said cabinet body, each of said body hinge leaves defining a pin receiving aperture; a closable member removably attached to the cabinet body, said cabinet body further including a pin mounting hinge leaf secured to each of its top and bottom portions and spaced in correspondency with said first and second body hinge leaves with each of the pin mounting leaves supporting a downwardly depending mounting pin which coaxially aligned with the mounting pin of the other pin mounting leaf, the mounting pin on one of said mounting hinge leaves being longer than the mounting pin of the other mounting pin leaf; said cabinet body further including a center keyhole aperture extending through the center of the rear surface and a plurality of off-center apertures extending through the rear surface at locations offset from the keyhole aperture, said method comprising the steps of:

(a) partially inserting a mounting screw with a head on its axial outboard end into a vertical wall at a predetermined position so that the head of the mounting screw is spaced from the wall;

(b) hanging the cabinet body on the partially inserted mounting screw by inserting the head of the mounting screw through the center keyhole aperture and positioning the rear cabinet body surface between the screw head and the wall;

(c) leveling the cabinet member by rotating the cabinet body about the rotational axis of the mounting screw disposed within the center keyhole aperture and thereafter inserting a screw into the vertical wall through at least one of the off-center apertures; and

(d) thereafter tightening the screws in the center keyhole in at least one of the off-center apertures to secure the cabinet body to the vertical wall;

(e) partially inserting the longer of said mounting pins in one

of said pin receiving apertures only after the cabinet body is secured to the wall;

(f) thereafter partially inserting the shorter of said mounting pins into the other of said pin receiving apertures; and

(g) simultaneously advancing each of the mounting pins further into their respective pin receiving apertures to bring each of the pin mounting hinges into contact with said body hinge leaves.

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**4,610,490**

## DOOR-OPERATING APPARATUS FOR ANALYZER

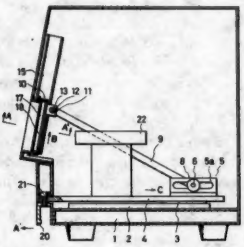
**Mitsuo Naito, and Toshio Watanabe, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan**

**Filed Aug. 2, 1984, Ser. No. 637,109**

**Claims priority, application Japan, Aug. 18, 1983, 58-127572[U]**

**Int. Cl.⁴ A47B *81/00***

**U.S. Cl. 312—272** **4 Claims**



1. An analyzer comprising an analyzer body having a bottom and a front wall having a lower opening near the bottom and an upper opening spaced from the bottom,

a first rail on said bottom extending forwardly and rearwardly of the analyzer bottom,

a slider slidable on said rail between a rearward position in which said slider is in said analyzer body and a forward position in which said slider extends out through said lower opening in said front wall,

means on said slider for moving it between said rearward position and said forward position,

a sample table mounted on said slider,

a second rail along side said upper opening in said front wall and a window guided by said second rail for movement between a lower position in which said window closes said upper opening and an upper position in which said window is above said upper opening so as to leave said upper opening open, and

a link having a lower end pivotally connected to said slider and an upper end pivotally connected to said window for operably connecting said window with said slider for movement of said window from said lower position to said upper position upon movement of said slider from said rearward position to said forward position,

said sample table being of a height to be accessible through said open upper opening when said slider is in said forward position.

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**4,610,491**

## HINGED BARRIER FOR A REFRIGERATOR SHELF

**Lowell J. Freeman, 95094 Turnbow La., Junction City, Oreg. 97448**

**Filed Jul. 16, 1984, Ser. No. 631,486**

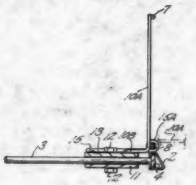
**Int. Cl.⁴ A47B *77/04***

**U.S. Cl. 312—291** **1 Claim**

1. A barrier assembly for adjustible attachment to a shelf to confine articles on the shelf or a portion of the shelf, said assembly comprising,

a barrier for normal disposition in an upright position and spaced above the shelf, said barrier including a frame having upper and lower members,

upper and lower clamping plates for disposition above and below a portion of the shelf, fastening means for urging



said clamping plates into shelf engagement, hinge members carried by the upper clamping plate and supporting said barrier in a hinged manner,

a spring in place on the lower member of the barrier and biasing said barrier to an upright position, and

limit stop means comprising angularly shaped wire grill components of the barrier and limiting hinged movement of said barrier in one direction to the upright position.

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**4,610,492**

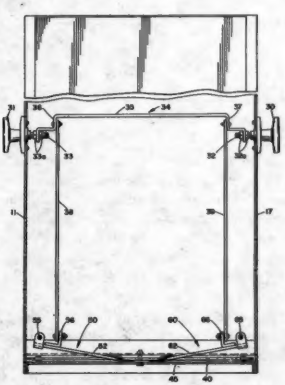
## ROTARY FILE LOCKING MECHANISM

**Lance E. Molander, Big Rock; Gabriel Tiegelmann, and Walter J. Kirhofer, both of Aurora, all of Ill., assignors to White Consolidated Industries, Inc., Cleveland, Ohio**

**Continuation-in-part of Ser. No. 618,996, Jun. 11, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,868**

**Int. Cl.⁴ A47B *49/00***

**U.S. Cl. 312—305** **15 Claims**



1. In a rotary file having an outer fixed cabinet and an inner cabinet rotatable on a vertical axis, a locking mechanism for retaining the rotatable inner cabinet at a fixed position, comprising:

a pair of stop members mounted on said fixed cabinet, means for simultaneously moving the members between a noninterfering and an interfering position with said inner cabinet, wherein one stop member when in the interfering position interferes with and precludes rotation of the inner cabinet in only a clockwise direction, the other stop member when in the interfering position interfering with and precluding rotation of the inner cabinet in only a counter-

clock-wise direction, so that the inner cabinet can be locked against rotation with respect to the outer cabinet in either direction at at least one position, and wherein when the stop members are in the non-interfering position free rotation of the inner cabinet is allowed.

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**4,610,493**

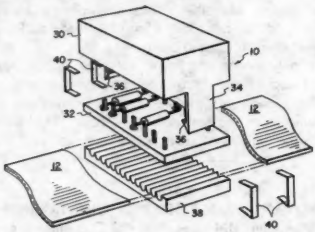
## ELECTRICAL CONNECTOR BLOCK

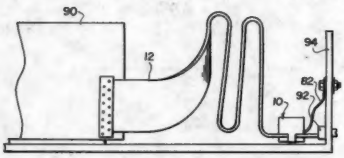
**Richard C. Masek, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Continuation of Ser. No. 590,931, Mar. 19, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,916**

**Int. Cl.[4] H01R *4/24***

**U.S. Cl. 339—14 R** **9 Claims**




1. An electrical connector block for providing transient protection for a flat ribbon cable having a plurality of conductors lying side-by-side in an insulating ribbon connectable to a circuit board mounted in a chassis comprising:

a base member adapted to lie over a portion of the ribbon cable;

a plurality of terminal contacts extending through said base member and having an upper connection end and a lower insulation-piercing end, said plurality of terminals disposed in said base member in a pattern so that at least some of said terminals are engageable over said insulation-piercing ends thereof to at least some conductors of the ribbon cable;

a bottom cover engageable on an opposite side of a ribbon cable from said base member;

mounting means connected between said base member and said bottom cover for urging said base member and bottom cover together with a ribbon cable therebetween;

a bus line suitable for connection to a ground wire being located on the upper end of said base member;

said plurality of terminal contacts being connected to said bus line; and

a ground wire connecting said bus line to said chassis for providing transient protection to the circuit board thereby.

**4,610,494**

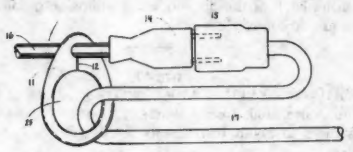
## FLEXIBLE SECURITY LOOP

**Paul A. Schauber, 8302 Kendale Rd., Baltimore, Md. 21234**

**Filed Nov. 23, 1984, Ser. No. 674,089**

**Int. Cl.[4] H01R *13/639***

**U.S. Cl. 339—75 P** **3 Claims**




1. For use in retaining a male plug of one electrical cord in mating relation to the female plug of another electrical cord against pulling forces on the cords that would normally tend to cause separation of the plugs, a flexible security loop having a pair of substantially coplanar cord receiving apertures, one of which is smaller than the other, the smaller of which is of a size to receive one electrical cord therewithin with the plug end adjacent one side of said flexible security loop and is smaller than the plug of the cord received therewithin, and the other of which receives the other cord therewithin and is of a size such that the plug of the cord to be received therewithin may be passed therethrough, the plug end of the cord to be received within the larger of said cord receiving apertures being entrained through the larger of said cord receiving apertures to the same side of said flexible security loop to which the plug end of the other electrical cord is adjacent and then looped back toward said flexible security loop for interconnection with the plug of the other cord.

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**4,610,495**

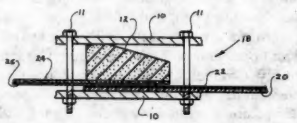
## SOLDERLESS CONNECTOR APPARATUS AND METHOD OF MAKING THE SAME

**Vincent R. Landi, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.**

**Filed Mar. 7, 1985, Ser. No. 708,981**

**Int. Cl.[4] H01R *9/09***

**U.S. Cl. 339—75 MP** **36 Claims**




1. In a solderless connector wherein mechanical means applies force against an elastomeric element to effect electrical contact between terminal portions of circuit devices, the improvement comprising:

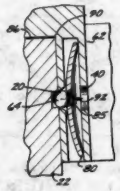
means for providing gradated impedance to said solderless connector, said means for providing gradated impedance including;

said elastomeric element having a preselected shape whereby the dielectric constant of said elastomeric element is varied when said elastomeric element is compressed.

## 4,610,496
## CONNECTOR MECHANICAL INTERLOCK USING BALL DETENTS

**Lawrence Schwartz, Huntington Beach; Jan A. Kilsdonk, Corona, and Jerry T. Steele, Fountain Valley, all of Calif., assignors to Flight Connector Corporation, Rancho Dominguez, Calif.**

**Filed May 24, 1985, Ser. No. 737,673**
**Int. Cl.[4] H01R *13/631***
**U.S. Cl. 339—91 B** **6 Claims**




1. A mechanical interlock system using a ball detent for interlocking the first and second connector halves of an electrical connector assembly comprising:

a detent receiving means formed on the front portion of said first connector half, said second connector half comprising a first elongated sidewall;

a first elongated recess of predetermined dimensions formed in said first side wall of said second connector half, said elongated recess dividing said first side wall into first and second wall portions, said second connector half having an opening to receive the front portion of said first connector half, an aperture being formed in said first wall portion, said aperture connecting said opening and said elongated recess;

a ball detent positioned in said aperture, a first portion of the surface of said ball detent extending partially into said elongated recess, a second portion of said ball surface partially extending into said opening; and

a washer member of predetermined dimensions having a receiving area and positioned in said elongated recess, said first portion of said ball surface extending partially into said washer member receiving area, the second portion of said ball surface extending into said opening whereby said washer member forces the ball detent into said detent receiving means when such first and second connector halves are mated thereby forming said mechanical interlock.

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## 4,610,497
## LAMP SOCKET DEVICE

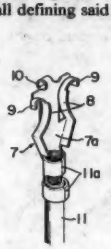
**Yoshihiro Tsuchida; Shigeru Tamura, and Yoshio Koda, all of Niigata, Japan, assignors to Nippon Seiki Kabushiki Kaisha, Niigata, Japan**

**Filed Nov. 28, 1983, Ser. No. 555,612**
**Claims priority, application Japan, Nov. 30, 1982, 57-182245[U]**
**Int. Cl.[4] H01R *11/22***
**U.S. Cl. 339—176 L** **23 Claims**

1. A lamp socket device for use with a push-in lamp body having lead wires, comprising:

(a) a socket body having a hollow space therein for partly receiving the push-in lamp body; and

(b) a pair of electrically conductive terminals accommodated in said hollow space in laterally spaced relation from each other for electric contact with the lead wires of the push-in lamp body, each of said electrically conductive terminals including a base and a pair of clamping portions extending transversely from said base and having bent locking arms held in engagement with inner walls defining said hollow space, said base having a locking hook extending from an edge thereof in said lateral direction transverse to said locking arms and held in engagement with an inner wall defining said hollow space, and,




(c) perpendicularly oriented retaining means in said socket body for engaging said locking arms and said locking hooks for preventing lateral and transverse movement of said terminals in said socket body.

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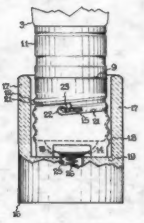
## 4,610,498
## POLARIZED THREADED LAMP BASE

**Leonard A. Thomas, Garrettsville, Ohio, assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 15, 1981, Ser. No. 273,736**
**Int. Cl.[4] H01R *13/642***
**U.S. Cl. 339—186 R** **6 Claims**



1. A polarized screw type lamp base comprising a thin-walled threaded metal shell having a bottom insulator attached thereto carrying an end contact,

and a locator on said shell protruding outwardly and adapted to engage a stop in a mating socket for achieving a predetermined angular orientation of the lamp base relative to its longitudinal axis,

said locator being an elongated piece of metal rod extending in a conformal manner lengthwise along and bonded to a predetermined location of a crest of the thread, said locator being effective for positioning said shell in said predetermined angular orientation when the leading end of said locator engages said stop in said mating socket.

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## 4,610,499
## DIFFRACTION DIFFUSION SCREEN WITH HOLOGRAPHICALLY SUPPRESSED ZERO-ORDER BEAM

**Mao-Jin Chern, Rancho Palos Vendes, and Ronald T. Smith, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

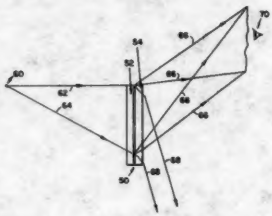
**Filed Nov. 1, 1984, Ser. No. 667,194**
**Int. Cl.[4] G02B *5/32***
**U.S. Cl. 350—3.7** **7 Claims**

1. A zero-order suppressed directional diffusing screen for directing light from an image light source to an observation area comprising:

a diffraction optics directional diffusing screen for diffract-

ing image light from the image light source to the observation area; and

a transmission hologram disposed adjacent said diffraction optics directional screen and configured to diffract only the zero-order portion of said image light transmitted by said diffraction optics directional diffusing screen away from the observation area.



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**4,610,500**

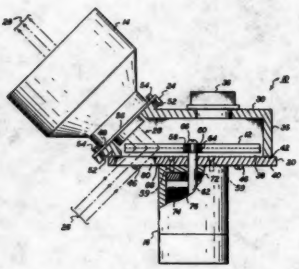
**HOLOGON LASER SCANNER APPARATUS**

**Charles J. Kramer, Pittsford, N.Y., assignor to Holotek Ltd., Rochester, N.Y.**

**Filed Aug. 16, 1984, Ser. No. 641,536**

**Int. Cl.[4] G02B *26/10***

**U.S. Cl. 350—3.71** **9 Claims**



1. Scanner apparatus comprising a hologon disc, a motor for rotating said disc, and a lens for focusing a laser beam diffracted by said hologon disc to an image surface, a housing unitarily assembling said hologon disc, lens and motor with each other, said housing having a base and a cap removably mounted on said base, said motor being attached to said base and having a shaft extended into said housing, said hologon disc being mounted on said shaft within said housing and spaced from said base, said cap having said lens removably mounted on said cap such that the axis of said lens is at a predetermined angle to said base, said base being a plate, said cap being a cover having a top and side wall, and the end of said side wall being referenced against the surface of said plate which faces said cover.

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**4,610,501**

**LIGHT BY-PASSING DEVICE**

**Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan**

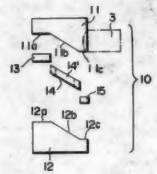
**Filed Mar. 23, 1984, Ser. No. 592,962**

**Claims priority, application Japan, Jun. 28, 1983, 58-116434**

**Int. Cl.[4] G02B *6/28, 6/36, 6/24***

**U.S. Cl. 350—96.10** **8 Claims**

5. A light by-passing device according to claim 4, wherein said second inclined surface of said one optical rod conductor reflects the light energy transmitted at said hole by said one optical rod conductor, said by-pass optical conductor being mounted on said one optical rod conductor to receive said reflected light.



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**4,610,502**

**METHOD OF MANUFACTURING A GEODETIC COMPONENT AND INTEGRATED OPTICAL DEVICE COMPRISING SAID COMPONENT**

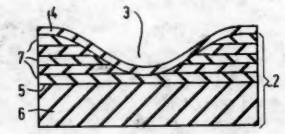
**Antonius J. A. Nicia, and Giok D. Khoe, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 13, 1984, Ser. No. 670,783**

**Claims priority, application Netherlands, Nov. 15, 1983, 8303905**

**Int. Cl.[4] G02B *6/10*; B44C *1/22*; C03C *15/00, 25/06***

**U.S. Cl. 350—96.12** **8 Claims**



6. An optical device comprising a laminated structure of a number of substantially equally thick layers on a surface of a support body, at least one non-spherical rotationally symmetrical recess in said laminated structure, and a plasma waveguide on said recess.

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**4,610,503**

**PROTECTIVE DEVICE FOR OVERHEAD WIRES CONTAINING OPTICAL FIBER UNITS**

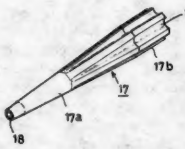
**Hideaki Miyazaki; Yoshikazu Yamano, both of Osaka; Yasunori Saito, Yokohama; Mikihiko Okano, and Tsuneo Nakano, both of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan**

**Filed Aug. 20, 1984, Ser. No. 642,526**

**Claims priority, application Japan, Aug. 31, 1983, 58-161543**

**Int. Cl.[4] G02B *6/36***

**U.S. Cl. 350—96.20** **3 Claims**



1. Structure for connecting overhead earth wires containing an optical fiber unit, said optical fiber unit being disposed in the

center of a bundle of conductors, said structure comprising connector means for connecting said overhead earth wires therein and for compression against said conductors for mechanical and electrical connections, and protecting means for protecting said optical fiber unit from being deformed when said connector means is compressed, said protecting member having a tapered portion merging into a straight portion and being formed with a through hole to pass said optical fiber unit therethrough and a plurality of longitudinal grooves extending from the middle of said tapered portion and through the complete length of said straight portion for receiving said conductors therein.

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**4,610,504**

## FIBRE-OPTIC SWITCHING MEANS

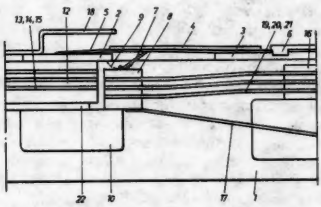
**Ake G. H. Thurenius, Skärholmen, and Viesturs J. Vucins, Älta, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Jun. 13, 1983, Ser. No. 503,743**

**Claims priority, application Sweden, Jul. 1, 1982, 8204085**

**Int. Cl.⁴ G02B *6/38***

**U.S. Cl. 350—96.20** **10 Claims**



**1.** A fibre-optical switching apparatus for switching the optical path between optical fibres comprising a first fixed fibre holder for holding at least a first optical fibre along an axis with an end of the fibre aligned with an end of the holder, first and second stop means, said first fixed fibre holder being arranged between said stop means, a slide movable in a direction transverse to the axis of said first optical fibre, a second optical fibre supported along an axis by said slide with an end of said second optical fibre adjacent adjacent said end of said first optical fibre, magnetically activated actuation means for moving said slide in a plane parallel to the axes of said optical fibres between first and second positions whereby said ends of said first and second optical fibres can switch between face-to-face relationship and transversely displaced relationship, said slide being limited in its travel by said first and second stop means, a filamentary means fixed in said, slide, said filamentary means being parallel to, and transversely displaced from said second optical fibre, and a second fixed fibre holder axially spaced with respect to said slide and engaging said second fibre and filamentary means such that said filamentary means and said second optical fibre lie in a plane parallel to said slide plane and during the transverse movement of said slide said second optical fibre and said filamentary means are fixed into an S-shaped form in at least one of said first and second positions whereby the slide is given a movement substantially parallel to said ends of said fibres.

**4,610,505**

## SHEATH FOR LIGHT WAVEGUIDES

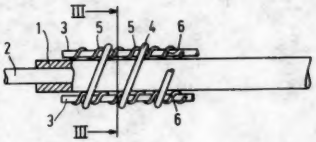
**Johann A. Becker, Overath; Helmut Wirth, Odenthal, and Werner Zell, Cologne, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 544,755, Oct. 24, 1983. This application May 6, 1985, Ser. No. 731,336**

**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239667**

**Int. Cl.⁴ G02B *6/44***

**U.S. Cl. 350—96.23** **19 Claims**



**1.** A sheath for glass fiber light waveguides, said sheath comprising:

a synthetic resin tube surrounding one of more light waveguides, said tube having an outer surface and a neutral bending plane;

a longitudinal element arranged against and parallel to the outer surface of the tube in the neutral bending plane for absorbing tensive and compressive forces applied to the sheath, said longitudinal element having a coefficient of expansion corresponding to that of the waveguides;

a plurality of projections attached to the longitudinal element; and

means for pressing the projections into the tube to deform the tube to mate with the projections.

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**4,610,506**

## SINGLE POLARIZATION OPTICAL FIBERS

**Toshihide Tokunaga, Kitaibaraki, and Masaaki Kato, Hitachi, both of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan**

**Filed Jan. 6, 1984, Ser. No. 568,725**

**Claims priority, application Japan, Jan. 11, 1983, 58-2388**

**Int. Cl.⁴ G02B *6/22***

**U.S. Cl. 350—96.33** **6 Claims**

**1.** A single-polarization optical fiber, comprising:

a substantially circular core consisting essentially of high-purity $SiO_2$ and at most about 5 mol% of $B_2O_3$, the core having a refractive index $n_1$;

a cladding disposed on the circumference of the core, the cladding having a refractive index $n_2$;

an inner jacket disposed on the circumference of the cladding, the inner jacket having a refractive index $n_3$; and

an outer jacket disposed on the circumference of the inner jacket, the outer jacket having a refractive index $n_4$;

wherein the refractive indexes satisfy the following relationship:

$n_4 \geq n_1 > n_3 > n_2$.

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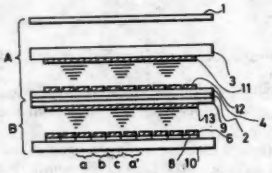
4,610,507

## COLOR LIQUID CRYSTAL DISPLAY DEVICE HAVING MULTICOLOR POLARIZERS

Hitoshi Kamamori; Yukiyoshi Tsunoda; Mitsuru Suginoya; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,328
Claims priority, application Japan, May 27, 1983, 58-93584
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—335 3 Claims




1. A color liquid crystal display device wherein a first display cell which has an optical shutter effect is disposed on a second TN liquid crystal cell which has a multi-color polarizing plate of double layer in which the absorption axes of respective layers have different absorption wavelength regions and are perpendicular to each other, and picture elements of said first liquid crystal cell and said second TN liquid crystal cell are arranged so as to correspond to each other.

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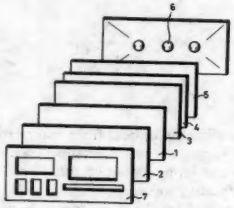
4,610,508

## LIQUID CRYSTAL DISPLAY DEVICE HAVING PARTICULAR DEGREE OF POLARIZATION

Jun Nakanowatari, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 25, 1984, Ser. No. 624,056
Claims priority, application Japan, Jun. 24, 1983, 58-112666
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—337 2 Claims



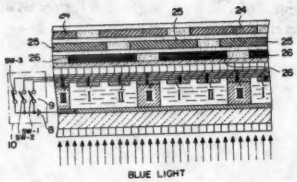

1. A liquid crystal display device in which a twisted nematic type liquid crystal display element is used as a light shutter and combined with color polarizer plates to provide color display characterized in that a nematic crystal added with a black coloring material is used and in that at least one of said polarizer plates has a degree of polarization of about 80% or less.

4,610,509

## LIQUID CRYSTAL COLOR DISPLAY PANELS

Kazuaki Sorimachi; Hiroshi Tanabe, both of Saitama; Katsumi Aota, Tokyo; Kanetaka Sekiguchi; Seigo Togashi, both of Saitama, and Etsuo Yamamoto, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,690
Claims priority, application Japan, Aug. 19, 1983, 58-151088
Int. Cl.[4] G02F 1/13; G02B 5/22
U.S. Cl. 350—339 F 5 Claims




1. A liquid crystal display panel comprising:
(1) a liquid crystal shutter device having,
(a) a pair of opposed glass plates,
(b) opposed electrode groups on the respective inner surfaces of the glass plates,
(c) at least one polarizer,
(d) a liquid crystal layer between the opposed electrode groups, and
(e) a voltage applying means for selectively applying a voltage across the electrode groups, and
(2) a color filter having a photosensitive emulsion layer sensitive to specific color light and provided on another transparent glass plate, the arrangement being such that the color filter is superposed on one surface of the liquid crystal shutter device and being processed by the steps of,
(i) while illuminating the liquid crystal shutter device from the other surface thereof by the specific color light, applying the voltage across the opposed electrode groups through the voltage applying means to form a latent image on the photosensitive emulsion layer, the latent image being aligned with the electrode groups, and
(ii) after a while, developing the latent image.

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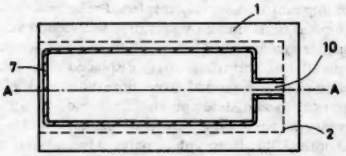
4,610,510

## LIQUID CRYSTAL DISPLAY CELL HAVING STEPPED SUBSTRATE ENDS AND METHOD FOR MANUFACTURE THEREOF

Fumiaki Funada, Yamatokoriyama; Hiroshi Kuwagaki, Jyoyo; Kunihiko Yamamoto, Nara, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1984, Ser. No. 618,450
Claims priority, application Japan, Jun. 13, 1983, 58-106419; Jun. 14, 1983, 58-107212
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—334 12 Claims




1. A method for manufacturing a liquid crystal display cell comprising the steps of:
providing a first flexible substrate having a first end;

providing a second flexible substrate which confronts said first flexible substrate and has an extended second end with respect to said first end of the said first flexible substrate so as to form a stepped portion;

depositing a sealing material at said stepped portion;

depressing one of the said first and second substrates against the other one; and

cutting said first and second flexible substrates at said stepped portion.

6. An intermediate liquid crystal display cell comprising:

top and bottom substrates;

a liquid crystal layer disposed between the top and bottom substrates;

an injection hole provided at edges of said top and bottom substrates for injecting liquid crystals;

the edges of said top and bottom substrates not coinciding with each other at the edge containing the injection hole so as to form a stepped portion; and

a sealing agent deposited at said stepped portion for sealing the injection hole, wherein the edges of the substrates are cut to provide a final liquid crystal display cell.

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**4,610,511**

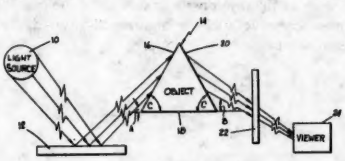
## ASSEMBLY AND METHOD FOR PRODUCING SPECIFIC OPTICAL INTERFERENCE PATTERNS

**Homer R. Denius, Jr., P.O. Box 143, Big Horn, Wyo. 82833**

**Filed Mar. 27, 1984, Ser. No. 593,938**

**Int. Cl.⁴ B44F *1/06***

**U.S. Cl. 350—402** **18 Claims**




1. An assembly for producing a visually perceptible light ray interference pattern, comprising:

(a) a means for providing light rays of visual frequencies;

(b) a first means for polarizing said light rays;

(c) a pyramidal shaped object having a square base and four symmetrical, triangular-shaped lateral faces, said object being composed of a transparent, birefractive material, and having at least four optical axes; and wherein said object internally receives a portion of said polarized light rays, organizes a portion of said received light rays into an interference pattern, and emits externally said organized light rays on converging optical paths; and

(d) a second means for polarizing said emitted light rays so that said interference pattern can be visually perceived by viewing said object along said converging optical paths via the second polarizing means.

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**4,610,512**

## MOUNTING FOR ZOOM LENS

**Shigeru Kamata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 23, 1984, Ser. No. 663,962**

**Claims priority, application Japan, Oct. 28, 1983, 58-166159[U]**

**Int. Cl.⁴ G02B *7/10***

**U.S. Cl. 350—429** **2 Claims**

1. A mechanical mounting for a zoom lens, comprising:

(a) a focusing lens and a lens holder for said focusing lens;

(b) a zoom lens and a lens holder for said zoom lens;

(c) a body tube having a guide slot;

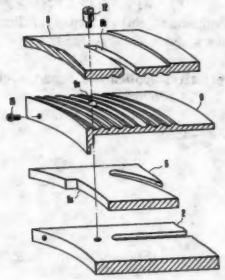
(d) a cam sleeve inserted into said body tube rotatable about an optical axis, and having a cam portion which intersects with said guide slot of said body tube;

(e) cam follower means having a follower member which is fixed to the lens holder of said zoom lens and engaging with an intersection point of said cam portion and said guide slot;

(f) a zoom actuator member for rotating said cam sleeve thus effecting a zooming operation;

(g) a focusing actuator member rotatable about said body tube for shifting said focusing lens back and forth in the direction parallel to the optical axis; and

(h) means for limiting an angle of rotation of said focusing



actuator member and said zoom actuator member, said limiting means comprising a stopper mounted on said body tube, which extends through said cam sleeve and reaches said focusing actuator member,

a cutout portion provided on said cam sleeve, which indicates a range of limitation of an angle of rotation which in turn determines a range of zooming, and

a circumferential slot provided on said focusing actuator member, which indicates a range of limitation of an angle of rotation which in turn determines a range of focusing,

said stopper being inserted into said cutout portion and said circumferential slot.

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**4,610,513**

## ILLUMINATION OPTICAL SYSTEM FOR AN ENDOSCOPE

**Kimihiko Nishioka, and Nobuo Yamashita, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

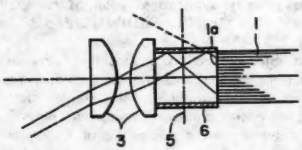
**Continuation-in-part of Ser. No. 477,672, Mar. 22, 1983, abandoned, which is a continuation of Ser. No. 171,759, Jul. 24, 1980, Pat. No. 4,415,240. This application Nov. 13, 1984, Ser. No. 671,014**

**Claims priority, application Japan, Jul. 27, 1979, 54-95720**

**The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.**

**Int. Cl.⁴ G02B *6/00, 23/00***

**U.S. Cl. 350—442** **6 Claims**




1. An illumination optical system for an endoscope comprising a light source and a light guide comprising a fiber bundle formed by bundling up a number of optical fibers each of which transmit light from said light source at the same time, a

positive lens system disposed in front of the said light guide, and a cylindrical reflection member arranged between the said lens system and an exit end face of the said light guide and having substantially the same diameter as the said light guide, said system satisfying the condition

$$D/f \geqq 0.4$$

wherein D represents the radius of the exit end face of said cylindrical reflection member and f represents the focal length of the positive lens system.

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**4,610,514**

## TELEPHOTO LENS SYSTEM

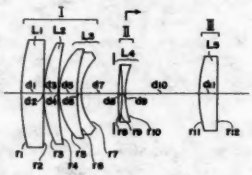
**Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 6, 1983, Ser. No. 539,826**

**Claims priority, application Japan, Oct. 7, 1982, 57-176702; Oct. 7, 1982, 57-176703**

**Int. Cl.⁴ G02B 9/60**

**U.S. Cl. 350—455** **10 Claims**



1. A telephoto lens system comprising from the object side to the image side;

a first lens unit of a positive refractive power consisting of a first positive component, a second positive meniscus component convex to the object side, and a third negative component of a doublet composed by cementing together a positive meniscus lens convex to the object side and a negative meniscus lens convex to the object side, the cemented surface in the third component being convex to the object side;

a second lens unit of a negative refractive power consisting of a doublet composed by cementing together a positive lens and a negative lens;

a third lens unit of a positive refractive power including at least a positive component; and

the second lens unit being shiftable along the optical axis with the first and third lens unit being stationary for focusing the whole lens system.

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**4,610,515**

## OBJECTIVE LENS FOR AN OPTICAL DISC

**Masashi Tanaka, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 19, 1984, Ser. No. 590,772**

**Claims priority, application Japan, Mar. 26, 1983, 58-50977**

**Int. Cl.⁴ G02B 9/12, 21/02**

**U.S. Cl. 350—474** **8 Claims**

1. An objective lens for recording or reproducing information on a optical disc at high density comprising, in succession from the farther conjugate point side of the objective lens toward the nearer conjugate point side thereof;

a first lens member consisting of a negative lens whose concave surface is directed toward the farther conjugate point side and a positive lens cemented together,

a second lens member consisting of a positive lens, and a third lens member consisting of a positive meniscus lens whose convex surface is directed toward the farther conjugate point side, and

said objective lens satisfying the following conditions:

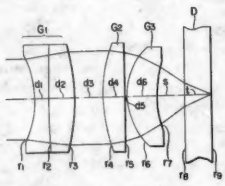
$$d3/f < 1.0$$

$$0.12 < n2 - n1$$

$$-0.02 < f/f_1 < 0.07$$

$$0.7 < f_2/f_3 < 1.5$$

$$0.6 < r_1/f < 1.5$$



wherein d3 represents air spacing between the first and second lens members; f represents focal distance of the entire system; n1 and n2 represent refractive indicas of the negative lens and the positive lens in the first lens member for the wavelength in use; $f_1$, $f_2$ and $f_3$ represent focal distances of the first, second and third lens members, respectively; and $r_1$ represents radius of curvature of the foremost lens surface of the first lens member whose concave surface is directed toward the farther conjugate point side.

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**4,610,516**

## PHOTOGRAPHIC LENS SYSTEM FOR ENDOSCOPES

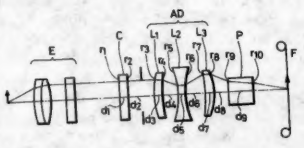
**Akira Yokota, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jun. 6, 1984, Ser. No. 617,731**

**Claims priority, application Japan, Jun. 9, 1983, 58-101615**

**Int. Cl.⁴ G02B 9/14**

**U.S. Cl. 350—475** **4 Claims**



1. A photographic lens system for endoscopes comprising an eyepiece having a positive refracting power and an adapter lens to be arranged on the rear of said eyepiece for photographing, said adapter lens comprising a positive lens component, a negative lens component and a positive lens component and having positive refractive power as a whole, said photographic lens systems being so designed as to satisfy the following conditions (1) and (2):

(1) $0.9 \leqq |R_1/R_2| \leqq 1.2$

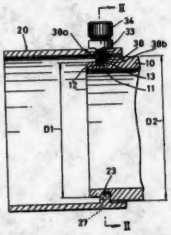
(2) $0.2 \leqq |f_n/f| \leqq 0.3$

wherein the reference symbols $R_1$ and $R_2$ represent radii of curvature on the first and last surfaces of said negative lens component, the reference symbol $f_n$ designates focal length of said negative lens component and the reference symbol f denotes focal length of said photographic lens system as a whole.

## 4,610,517
## CLAMP FOR LENS HOOD

Kunihiro Fukino, Fujisawa, and Yoshiro Kotaka, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,487
Claims priority, application Japan, Oct. 24, 1983, 58-163276[U]
Int. Cl.[4] G02B 7/00; F16L 37/12
U.S. Cl. 350—580 8 Claims




1. A clamping device for fixedly securing an accessory such as a lens hood to the outer periphery of a lens barrel, said lens barrel including a cylindrical outer sleeve which includes an annular collar portion formed thereon around the external circumference thereof near the forward end of said outer sleeve, and an annular groove being formed along said collar portion between said collar portion and the forward end of said outer sleeve, the device comprising:

(a) a cylindrical adaptor member having an internal diameter larger than the external diameter of said annular collar portion;

(b) an annular collar member formed on said adaptor member around the circumference thereof and extending radially inwardly from said adaptor member, said collar member having an inner periphery of a diameter larger than the external diameter of said outer sleeve and smaller than the external diameter of said collar portion;

(c) a clamp member extending from the outside of the cylindrical form of said adaptor member through said adaptor member and said collar member, said clamp member including an engagement portion movable between a first position in which said engagement portion is disposed radially inwardly from the inner periphery of said collar member and a second position in which said engagement portion is retracted from said first position and means for holding said engagement portion at least at said first position, said engagement portion being adapted to fit into said groove on said outer sleeve in said first position; and

(d) a plurality of projection members extending radially inwardly from the inner periphery of said collar member, an inner end of each of said projection members being adapted to fit into the groove of said outer sleeve.

## 4,610,518
## INVOLUTE BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Dec. 14, 1984, Ser. No. 681,972
Int. Cl.[4] G02B 5/10; F24J 2/10, 2/14
U.S. Cl. 350—630 1 Claim

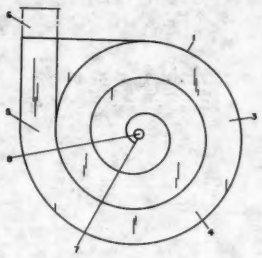
1. An involute beam concentrator comprising in general an involute glass wall forming a spiral reflective chamber for the reception and concentration of a beam of light from a prismatic beam concentrator, and comprising in particular;

an involute glass wall (1) forming an involute curve through three revolutions around a central axis parallel thereto, said involute wall having two parallel sides,

a front wall (2) and a rear wall (3), said front wall and said rear wall mounted on opposite said sides of said involute wall to form a chamber (4), said chamber being spiral in cross section and rectangular in longitudinal section,

said involute wall, said front wall and said rear wall having interior reflective surfaces,

a rectangular port (5) formed by the terminating section of said involute wall and by the adjacent section of said involute wall, said port serving as an opening through which said beam (6) from a prismatic beam concentrator is received into the involute beam concentrator, and

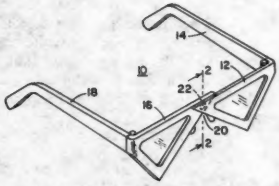



a circular aperture (7) located in the center of said rear wall, said aperture serving as an opening through which a concentrated circular beam (8) is emitted from the involute beam concentrator.

## 4,610,519
## EYEGLASS ASSEMBLY

Roger L. Hyman, 5249 N. 35 St., Milwaukee, Wis. 53209

Filed Jan. 14, 1985, Ser. No. 691,283
Int. Cl.[4] G02C 1/00
U.S. Cl. 351—86 5 Claims




1. An eyeglass assembly comprising:

a first lens holding frame having a temple piece pivotally attached to and extending rearwardly from an edge portion of said first frame

a second lens holding frame having a temple piece pivotally attached to and extending rearwardly from an edge portion of said second frame

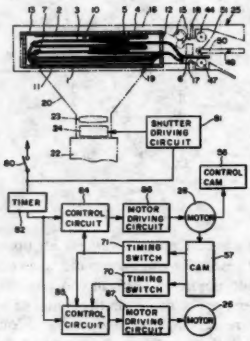
said first and second frames releasably and pivotally connected to each other at a connection point in the nose piece zone in an overlapping manner with one of said frames having a post receiving socket portion of a connector disposed within a recess in the nose piece zone of said frame and the other of said frames having a post projecting portion of the connector disposed within a recess in the nose piece zone of said other frame so that said frame pieces will be flush against each other upon being connected and no portion of the connector will be visible.

4,610,520

## FILM UNIT WITHDRAWING APPARATUS

Tomoyuki Takahashi; Masashi Kato, and Hisashi Kikuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 19, 1985, Ser. No. 713,631
Claims priority, application Japan, Mar. 26, 1984, 59-56287
Int. Cl.[4] G03B *17/52*
U.S. Cl. 354—86 9 Claims




1. A film unit withdrawing apparatus in which film units contained in a film pack and having tabs are withdrawn and passed through pressure apparatus, comprising:

withdrawing means for tabs connected to said film units and adapted to hold and withdraw a said tab projecting outside of said film pack, said tab withdrawing means withdrawing a pull end of one of said film units to which a said tab is attached, from said film pack in order to pass said pull end through said pressure apparatus by withdrawing said tab and thereafter tearing off the tab from said film unit;

film unit withdrawing means adapted to hold and withdraw a pull end of said film unit after passing it through said pressure apparatus, said film unit withdrawing means withdrawing said film unit from said film pack while passing it through said pressure apparatus; and

means operatively connecting said tab withdrawing means with said film unit withdrawing means, said connecting means actuating said film unit withdrawing means at a time when the tab is torn off from the film unit by said tab withdrawing means.

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4,610,521

## POWER SUPPLY UNIT FOR ELECTRONIC FLASH

Akira Inoue, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Division of Ser. No. 535,027, Sep. 23, 1983, Pat. No. 4,566,769. This application Jun. 28, 1985, Ser. No. 749,786
Claims priority, application Japan, Dec. 29, 1982, 57-229859; Feb. 15, 1983, 58-023626
Int. Cl.[4] G03B *15/05;* H05B *41/18*
U.S. Cl. 354—145.1 18 Claims

1. A power supply unit for an electronic flash, comprising:

a converter for converting an output from a low voltage source, coupled to the input of the converter, to a high d.c. voltage output;

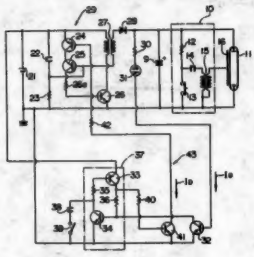
said voltage source and converter being in a first closed loop current path;

a main discharge capacitor adapted to be charged by the d.c. voltage output from the converter;

means for detecting when the main discharge capacitor has been charged to a given voltage;

switching means including an electrical switch having electrical contacts which are movable between an open and a closed position for starting the converter; and

a converter drive circuit including semiconductor latch means activated by a signal from the switching means to continuously deliver a drive signal to the converter enabling the converter to charge the main discharge capacitor and be turned off by a signal from the detecting means



to cease to drive the converter until being reactivated by relatching of said switching means;

said voltage source and said semiconductor latch means being arranged in a second closed-loop current path;

said switching means being coupled to said converter drive circuit in a manner such that said semiconductor latch means isolate said switching means from both the first and second closed loop current paths.

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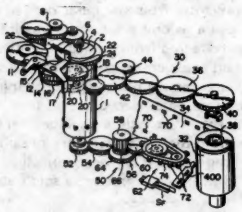
4,610,522

## MODE CHANGE-OVER DEVICE FOR PRE-WINDING TYPE CAMERA

Takashi Tobioka; Tetuo Nishizawa; Minoru Ishiguro, all of Ohmiya; Toshio Yoshida, Ibaragi; Masanoshin Komori, Ohmiya; Seiji Asano, Ohmiya; Takeshi Yoshino, Ohmiya, and Hiroshi Hara, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 4, 1984, Ser. No. 657,689
Claims priority, application Japan, Oct. 4, 1983, 58-185700
Int. Cl.[4] G03B *1/12, 1/60*
U.S. Cl. 354—173.1 3 Claims



1. A prewinding type photographic camera capable of receiving a film cartridge in which there is provided means for extracting film from the film cartridge and winding the film on a take-up spool during a prewinding mode, means for rewinding the film from the spool to the film cartridge during a shooting mode and means for switching the mode of operation of the camera selectively between the prewind mode and the shooting mode which comprises:

a back lid movable between an open position and a closed position;

a charge member adapted to operate in response to opening and closing of said back lid;

a counter adapted to operate in response to winding and rewinding of the film;

a mode retainer member for retaining a selected mode of operation; and

a retainer member jointly responsive to said counter and to said charge member for locking said mode retainer member when the counter is in a counting position and unlocking said mode retainer member then the counter is in an initial position;

said switching means including a mode change over member responsive to the mode retainer member which is locked when said mode retainer member is locked by said retainer member and is unlocked when said mode retainer member is unlocked by said retainer member and a mode change over switch responsive to the mode change over member for changing the mode of operation of the camera when the mode change over member is unlocked.

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**4,610,523**

**OPERATION CONTROL MECHANISM FOR CAMERA**

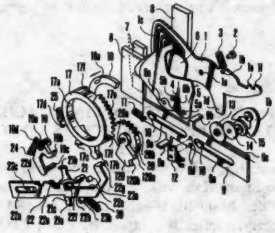
**Takayuki Tsuboi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 552,488, Nov. 16, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 710,523**

**Claims priority, application Japan, Nov. 17, 1982, 57-202474**

**Int. Cl.[4] G03B *3/10, 9/14***

**U.S. Cl. 354—195.1** **30 Claims**



4. An operation control device for a camera, comprising:

(a) electromagnetic drive means for causing first and second operations related to effecting an exposure to be carried out by electromagnetic force;

(b) operating means arranged to engage said electromagnetic drive means when the first operation of said electromagnetic drive means is initiated, and to operate in a manner determined by the relative position thereof; and

(c) release means for disengaging said electromagnetic drive means from said operating means after the manner of operation of said operating means has been determined by engagement with said electromagnetic drive means, whereby said electromagnetic drive means after having been released from engagement with said operating means carries out the second operation.

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**4,610,524**

**DIAPHRAGM BLADES**

**Friedel Rühl, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany**

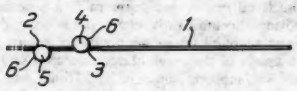
**Filed Mar. 21, 1985, Ser. No. 714,499**

**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412061**

**Int. Cl.[4] G03B *9/02;* G02B *26/02***

**U.S. Cl. 354—274** **14 Claims**

1. A diaphragm blade for an iris diaphragm in an optical instrument, comprising a leaf having surfaces which are planar and parallel to one another, said surfaces being equipped in a given position with a bearing pin and a control pin, said pins



each comprising a body having a bearing surface curved in all three coordinate directions and having a circular cross-section.

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**4,610,525**

**ELECTRONIC FLASH DEVICE**

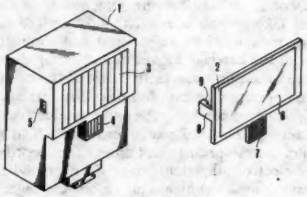
**Masaaki Yoshida, and Hiroyuki Kataoka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 603,992, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 454,232, Dec. 29, 1982, abandoned. This application Jul. 25, 1985, Ser. No. 758,842**

**Claims priority, application Japan, Jan. 9, 1982, 57-1965; Jun. 2, 1982, 57-82036**

**Int. Cl.[4] G03B *7/097***

**U.S. Cl. 354—415** **5 Claims**



4. An electronic flash device comprising:

(a) a package housing at least part of said flash device;

(b) first flash means on said package for emitting a light;

(c) second flash means on said package, said second flash means emitting a light of different diffusion characteristic from that of the light from said first flash means; and

(d) a diffusion panel, when attached, for covering both of said first flash means and said second flash means, having a first part for covering said first flash means and a second part for covering said second flash means, said first part having a coefficient of diffusion different from said second part.

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**4,610,526**

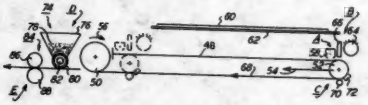
**REPRODUCING MACHINE**

**Gilbert A. Aser, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 126,586, Mar. 3, 1980, abandoned. This application Jul. 3, 1985, Ser. No. 751,478**

**Int. Cl.[4] G03G *15/14, 15/22***

**U.S. Cl. 355—3 BE** **6 Claims**



1. An improved electrophotographic reproducing machine of the type having a fixed platen for stationarily supporting an

original document to be reproduced, a photoconductive belt having a photoconductive surface on one side thereof, means for charging the photoconductive belt surface with an uniform charge, means for incrementally scanning the original document on the fixed platen one segment at a time and concurrently exposing the uniformly charged photoconductive belt surface to the scanned image segments to record an electrostatic latent image of the original document on said photoconductive belt surface one segment at a time, and means for transferring the electrostatic latent image to a dielectric copy sheet, wherein the improvement comprises:

a translatable carriage having fixedly mounted thereon in fixed relationship to each other the charging means, the scanning and exposing means, the transfer means, and a roller about which the photoconductive belt is entrained, the roller having an axis parallel to the fixed platen;

means to translate the carriage in a direction parallel to the fixed platen and perpendicular to the roller axis to effect the incremental scanning of the original document and concurrent recording thereof on the photoconductive belt surface and in the oppposite direction to return the carriage for scanning the same document again or a subsequent document placed on the fixed platen; and

the photoconductive belt having two ends and being entrained about the carriage roller at a location intermediate the ends, means for holding one end of the photoconductive belt stationary at least during the recording of the electrostatic latent image thereon, the other end of the photoconductive belt being attached to a fixedly positioned take-up roll adapted to take up the slack of the photoconductive belt and keep it taut about the carriage roller as the carriage moves in a scanning direction or to dispense the photoconductive belt as the carriage moves in the opposite direction to return the carriage for subsequet document scanning, the photoconductive belt surface confronting the fixed platen and being held stationarily parallel thereto prior to and during the recording thereon of the electrostatic latent image segments, whereupon the carriage translating means moves the carriage, so that the portion of the photoconductive belt surface having the recorded latent image segments travels around the carriage roller towards the transfer means and take-up roller, while the unrecorded portion of the photoconductive belt is held stationary.

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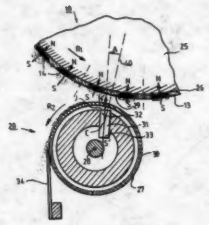
**4,610,527**

## APPARATUS FOR DEVELOPING LATENT MAGNETIC IMAGES

**Bernard Cherbuy, Belfort, and Jean Magnenet, Chaux, both of France, assignors to Cii Honeywell Bull (Societe Anonyme), Paris, France**

**Filed Oct. 19, 1984, Ser. No. 662,909**
**Claims priority, application France, Nov. 17, 1983, 83 18282**
**Int. Cl.[4] G03G *19/00***
**U.S. Cl. 355—3 DD** **23 Claims**



1. An apparatus for developing latent magnetic images comprising a recording medium (10) driven in a predetermined direction along a path and provided with a magnetic recording surface (13) on which a plurality of magnetized zones (14) having the same magnetic polarity and intensity are formed; means (15) disposed at a first location along the path for applying powdered magnetic developer particles to the magnetized zones; and a retouching device (20) for removing a portion of the developer particles which have been applied on said recording surface, said retouching device comprising an endless conveyor (27) adapted to be driven continuously and disposed such that an exterior surface (30) of the conveyer is moved into immediate proximity with a second location (29) of the path followed by the recording surface, said second location being downstream of the first location where developer particles are applied to said recording surface; and a magnetized element (31) having a center (C) and magnetic poles defining a magnetic axis (N'S'), said magnetized element being fixedly disposed within said endless conveyer in proximity with said second location and such that its magnetic axis is inclined by an angle (A) less than or equal to 45° with respect to a straight line (40) which passes through said center and is normal to said recording surface at said second location, said magnetic axis being inclined in an upstream direction opposite to the direction of displacement of said recording surface along the path, and said magnetized element being oriented so that one of its magnetic poles which is closest to said second location has a polarity which is opposite to the polarity of said magnetized zones on the recording surface, the magnetized element being adjusted with respect to the recording surface so as to leave extant on each magnetized zone of the recording surface which passes the second location a layer of developer particles having a thickness which is approximately equal to a predetermined value.

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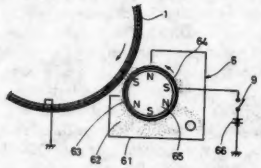
**4,610,528**

## ELECTROPHOTOGRAPHIC COPYING MACHINE WITH DELAYED DEVELOPMENT BIAS VOLTAGE APPLICATION

**Hiroshi Kinashi, Uji, and Kozo Takahashi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 20, 1984, Ser. No. 591,583**
**Claims priority, application Japan, Mar. 30, 1983, 58-58518**
**Int. Cl.[4] G03G *15/09***
**U.S. Cl. 355—3 DD** **4 Claims**



1. A developing device for an electrophotographic copying machine, comprising:

means for providing toner particles and carrier particles;

photoreceptor means for receiving said toner particles thereon to form an electrostatic latent toner image;

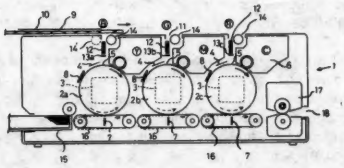
magnetic roller means, opposed to said photoreceptor means, for attracting said toner and carrier particles thereto and for applying said toner particles to said photoreceptor means, wherein said magnetic roller means includes a rotating sleeve and a magnet;

means for preventing the attraction of said carrier particles to said photoreceptor means by applying a delayed voltage to said rotating sleeve of said magnetic roller means to stabilize the attraction between said photoreceptor means and said magnetic roller means, wherein said voltage is delayed from about 20 to about 300 msec after said rotating sleeve starts to rotate.

## 4,610,529
## APPARATUS FOR RECORDING COLOR IMAGES

**Yutaka Koizumi, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed May 16, 1985, Ser. No. 734,971**
**Claims priority, application Japan, May 21, 1984, 59-100651**
**Int. Cl.[4] G03G 5/12**
**U.S. Cl. 355—4** **2 Claims**



1. An apparatus for recording color images, comprising:
three photosensitive members and means for selectively driving each in a normal direction and a reverse direction;
means for forming on each one of said three photosensitive members a latent image of a respective one of three color components of an optical image of an original in color obtained by color separation;
means for developing the latent image of each photosensitive member with a toner of a respective one of three primary colors by a subtractive color mixing method to produce three toner images of different colors; and
means for printing by transfer-printing on a sheet of support material the three toner images of different colors by superposing them one over another to produce a color image of the original;
wherein each photosensitive member has an area and an axial length large enough to accommodate an image of an original of a selected maximum size, and wherein when the photosensitive members are each driven in the normal direction, the three color components of the optical image of the original in color are formed on the respective photosensitive members as latent images which are developed by the developing means into toner images of different colors retained on the respective photosensitive members and, when the photosensitive members are each driven in the reverse direction, a sheet of transfer material is fed at the same velocity and direction as the velocity and direction of the photosensitive members and successively brought into contact with the photosensitive members in their transfer-printing positions to print by transfer-printing the toner images of three different colors on the sheet of support material by superposing them one over another to produce a color image of the original in color, each of said photosensitive members reversing its direction in timed relation to the feeding of the sheet of support material in such a manner that the trailing end of the toner image on each of said photosensitive members coincides with the leading end of the sheet of support material.

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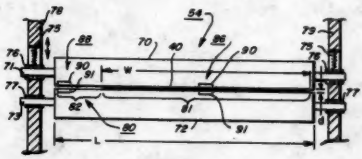
## 4,610,530
## CAPACITIVE PAPER PROPERTY SENSOR FOR COPYING APPARATUS

**Donald R. Lehmbeck, Penfield, and Martin E. Banton, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 21, 1984, Ser. No. 685,004**
**Int. Cl.[4] G03G 15/00**
**U.S. Cl. 355—14 TR** **8 Claims**

1. In an electrostatic copying or printing apparatus including a copy sheet path with at least one pair of rotatable copy sheet transport members, said copy sheet transport members forming a first nip segment between which the copy sheets being fed pass, and a second nip segment through which the copy sheets do not pass, the combination of:
(a) a first capacitor for generating a signal representative of the nip size of said first nip segment whereby, when a copy sheet is passing through said first nip segment, the signal output of said first capacitor represents the capacitance of said copy sheet;



(b) a second capacitor for generating a signal representative of the nip size of said second nip segment;
(c) means for comparing the signal outputs of said first and second capacitors to determine the dielectric constant of said copy sheet as said copy sheet passes through said first nip segment; and
(d) means for determining the moisture content of said copy sheet from said dielectric constant.

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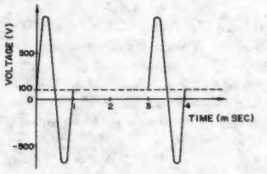
## 4,610,531
## DEVELOPING METHOD AND APPARATUS

**Nobuhiro Hayashi, Yokohama; Kimio Nakahata, Kawasaki; Hatsuo Tajima, Matsudo, and Shunji Nakamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 27, 1984, Ser. No. 644,560**
**Claims priority, application Japan, Sep. 5, 1983, 58-162803; Sep. 5, 1983, 58-162804; Dec. 22, 1983, 58-243446**
**Int. Cl.[4] G03G 15/08**
**U.S. Cl. 355—14 D** **18 Claims**




1. A developing apparatus for developing a latent image formed on a latent image bearing member, comprising:
a developer carrying member having a surface for carrying thereon a layer of developer, said developer carrying member being exposed, at a developing position, to the latent image bearing member with a clearance therebetween; and
means for applying a developing bias to apply an alternating electric field across the clearance, wherein said developing bias applying means applies the alternating electric field across the clearance during a first period of the developing operation and does not apply the alternating electric field thereacross during a second period of the developing operation.

## 4,610,532
## TONER DISPENSING CONTROL

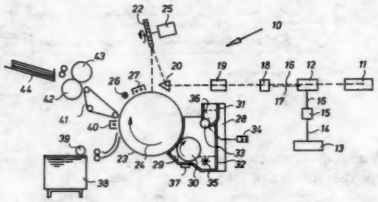
**Lucien A. De Schamphelaere, Edegem; Freddy M. Librecht, Boechout, and Willy G. Verlinden, Edegem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium**

**Filed May 24, 1984, Ser. No. 613,737**

**Claims priority, application European Pat. Off., Jun. 3, 1983, 83200802.3**

**Int. Cl.⁴ G03G *15/09***

**U.S. Cl. 355—14 D** **10 Claims**



1. A method for controlling the dispensing of toner powder in xerographic printing of the type wherein a photoconductor is electrostatically charged and image-wise exposed by line-wise exposing the photo-conductor by appropriate activation of discrete spotlike sources of radiation, spaced along said line, in response to corresponding data bits, and the electrostatic image thus produced is developed by contact with a toner mixture comprising magnetically susceptible carrier particles and toner powder which is attracted thereto and including a source of fresh toner powder operable to add such fresh powder to said toner mixture in a generally given incremental rate upon the application thereto of a control signal: comprising generating a control signal in response to repetitive accumulation of a selected number of data bit signals activating said exposure sources during exposure and applying the thus generated control signal to said toner powder source to operate the latter to add fresh toner powder; measuring the electrical permeability of said toner mixture and determining when said measured permeability value deviates from a reference value; and varying the selected number of such accumulated data bit signals generating said control signal in response to a deviation between said measured permeability and said reference value.

## 4,610,533
## AUTOMATIC DOCUMENT FEEDING DEVICE

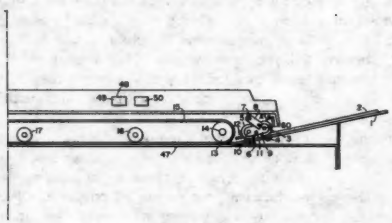
**Naomi Takahata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 338,377, Jan. 11, 1982, abandoned. This application Mar. 13, 1985, Ser. No. 710,938**

**Claims priority, application Japan, Jan. 20, 1981, 56-7021; Jan. 21, 1981, 56-8490**

**Int. Cl.⁴ B65H *9/20***

**U.S. Cl. 355—14 SH** **5 Claims**



1. An automatic feeding device comprising:

transport means for transporting a sheet document to a predetermined position;

document detecting means for detecting an edge of the sheet document;

timer means for activating said transport means for a predetermined period in response to a detection by said document detecting means to transport and stop the sheet document at the predetermined position;

a manually operable input means;

control means for causing an image forming operation to be initiated after the sheet reaches the predetermined position and stops at that position;

regulating means changing the predetermined position; and prohibiting means responsive to an input from said manually operable input means for prohibiting initiation of the image forming operation under control of said control means after the sheet reaches the predetermined position and stops at that position;

wherein document feeding may be performed without an associated image forming operation.

## 4,610,534
## CLEANING DEVICE FOR COPYING MACHINES

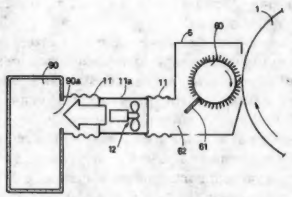
**Fukusaburo Ito, Nara; Hiroshi Kataoka, and Keizoh Itoh, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 9, 1984, Ser. No. 588,078**

**Claims priority, application Japan, Mar. 31, 1983, 58-47818[U]**

**Int. Cl.⁴ G03G *21/00***

**U.S. Cl. 355—15** **19 Claims**



1. A cleaning device for cleaning residual toner from a photosensitive surface of an electrophotographic copying maching comprising:

means for removing the residual toner from the photoconductive surface;

receptacle means for collecting said residual toner;

an air duct interconnecting said means for removing to said receptacle means, said air duct transferring the residual toner from said means for removing to said receptacle means of an airstream; and

a vacuum fan disposed within said air duct between said means for removing and said receptacle means and creating the airstream.

## 4,610,535
## APPARATUS FOR REPRODUCING A COLORED SURFACE ON A PHOTOGRAPHIC EMULSION

**Jean-Claude Lamere, Villaret, 1411 Essertines-sur-Yverdon, Switzerland**

**Filed Jul. 25, 1985, Ser. No. 759,100**

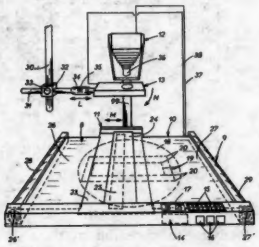
**Claims priority, application Switzerland, Jul. 27, 1984, 3643/84**

**Int. Cl.⁴ G03B *27/32, 27/52***

**U.S. Cl. 355—32** **18 Claims**

1. An apparatus for reproducing a coloured surface on a photograpic emulsion by controlled synthesis of colours corresponding to a reference selected on a colour chart, the appara-

tus comprising an exposure unit with a light source arranged to emit light corresponding to three primary colours, a sensitometer with a tray for carrying a substrate coated with a given photographic emulsion, a mask for covering this emulsion and a drive mechanism for displacing the mask relatively to this emulsion, and a central control unit with a keyboard for selecting the references of the colour chart, with means for controlling the exposure unit and with means for controlling the drive mechanism for displacement of the mask, wherein the sensitometer tray is rotatable and comprises a suction device for maintaining the substrate coated with the photographic emulsion on this tray, the mask comprises a screen which is movable



in one direction, is provided with an elongated exposure window, substantially perpendicular to this direction, and whose length is such that the window may entirely scan the photographic emulsion during displacement of the screen, and a shutter which is movable for displacement in the same direction as the displacement of the screen and is capable of selectively covering the exposure window, and the exposure unit comprises a filter box containing three movable filters which correspond to said three primary colours and are associated with a mechanism allowing their displacement so that these filters may be selectively inserted between the light source and the exposure window of the mask.

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**4,610,536**

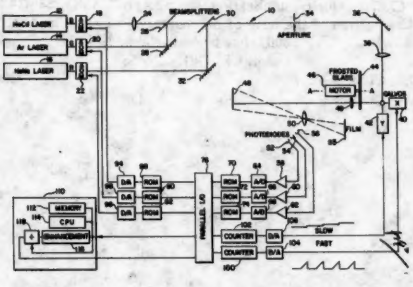
## LASER SCANNING AND PRINTING APPARATUS

**William K. Smyth, Sudbury; Richard J. Chen, Winchester, and William T. Plummer, Concord, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed May 6, 1985, Ser. No. 730,828**

**Int. Cl.[4] H04N *1/46*; G03B *33/12***

**U.S. Cl. 355—38** **29 Claims**



1. Apparatus for scanning an original picture and printing a reproduction thereof by exposing a photosensitive material, said apparatus comprising:

a source of coherent laser light;

means for modulating the intensity of the laser light provided by said source of coherent laser light;

means for line scanning the modulated laser light over the surface of the original picture;

photoresponsive means for detecting the light intensity reflected from the original picture during a first line scan thereof by said laser light modulated at substantially constant intensity and providing an electronic information signal corresponding to the intensity of said reflected light;

control means responsive to said electronic information signal for providing a control signal to said modulating means to modulate the intensity of said laser light during a succeeding second line scan of the original picture by said laser light; and

means for directing light reflected from the original picture during said second line scan to the photosensitive material to expose a reproduction of the original picture, said control signals from said control means operating to modulate the intensity of said laser light in a manner effecting selective lightening or darkening of selected areas of the photosensitive material exposed by said laser light reflected from the original picture.

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**4,610,537**

## PHOTOGRAPHIC IMAGE INFORMATION DETECTING DEVICE

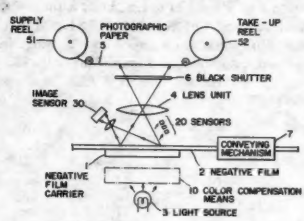
**Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jan. 14, 1985, Ser. No. 691,110**

**Claims priority, application Japan, Jan. 19, 1984, 59-7533; Jan. 19, 1984, 59-7536**

**Int. Cl.[4] G03B *27/72***

**U.S. Cl. 355—68** **11 Claims**




1. A photographic, image information detecting device which comprises a light source for illuminating an original film, a storage-type light receiving element for detecting the amount of light from said original film, a driving circuit for driving said storage-type light receiving element, and a comparing/controlling means for comparing the output data of said storage-type light receiving element with a predetermined value and for controlling the amount of emission from said light source, whereby the dynamic range of said storage-type light receiving element is widened so as to detect the picture image information of said original film.

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**4,610,538**

## COLOR COMPENSATION METHOD IN PHOTOGRAPHIC PRINTER

**Yuji Takenaka, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 16, 1985, Ser. No. 724,634**

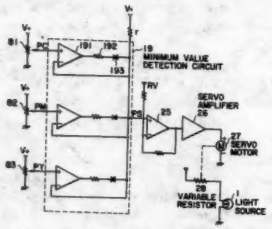
**Claims priority, application Japan, May 1, 1984, 59-88061; Dec. 19, 1984, 59-268107**

**Int. Cl.[4] G03B *27/72***

**U.S. Cl. 355—69** **14 Claims**

1. A color compensation method for color printers using CMY-color compensation filters arranged in a light path of a light source for photographic printing, comprising: positioning a color compensation filter which is selected from said CMY-

color compensation filters and has the smallest compensation value at a predetermined position with respect to said light path, and adjusting the amount of light from the light source to




a target value set for the positioned filter, and inserting the other two color compensation filters within said light path for color compensation at said target value.

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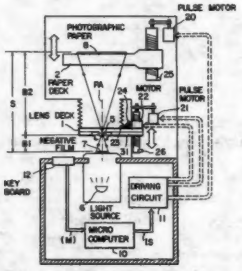
**4,610,539**

## METHOD FOR AUTOMATICALLY SELECTING A LENS

**Rokusaburo Kaneko, and Yuji Takenaka, both of Kaisei, Japan, assignors to Fuji Photo Film Co, Ltd., Kanagawa, Japan**

**Continuation-in-part of Ser. No. 610,817, May 15, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,439**
**Claims priority, application Japan, May 20, 1983, 58-88890**
**Int. Cl.[4] G03B *27/32***
**U.S. Cl. 355—77** **6 Claims**




1. An automatic lens selection method for selecting a lens unit among plurality of lens units having different focal lengths in accordance with a designated magnification of enlargement, which is characterized by the steps of:

selecting a lens unit having the greatest focal length among said plural lens units,

calculating the conjugate length thereof based on the magnification of enlargement and the focal length of said lens unit,

judging whether the calculated conjugate length falls within the effective range of a system or not;

searching a lens unit having the second greatest focal length if said conjugate length falls outside the effective range; and

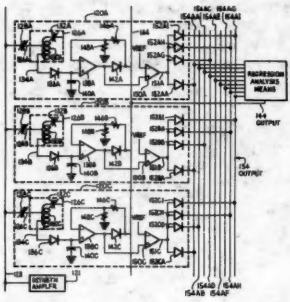
repeating the above procedure until a lens unit falling within the effective range is selected.

**4,610,540**

## FREQUENCY BURST ANALYZER

**Paul W. Mossey, Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Jul. 6, 1982, Ser. No. 395,570**
**Int. Cl.[4] G01P *3/36*; G01R *23/02***
**U.S. Cl. 356—28.5** **11 Claims**




1. A signal analyzer for determining the input frequency of an input signal comprising:

a first group of filter means, each having a predetermined frequency response characteristic, for producing a first identification signal which identifies the filter means in the first group having the greatest response to the input signal and for producing a first magnitude signal indicative of the magnitude of that response;

a second group of filter means, each having a predetermined frequency response characteristic, for producing a second identification signal which identifies the filter means in the second group having the greatest response and for producing a second magnitude signal indicative of the magnitude of that response; and

regression analysis means coupled to said filter means for producing a signal in response to the identification and magnitude signals indicative of the frequency of the input signal.

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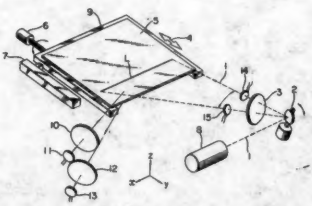
**4,610,541**

## FOREIGN SUBSTANCE INSPECTING APPARATUS

**Akikazu Tanimoto, Yokohama, and Kazunori Imamura, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan**

**Filed Apr. 3, 1984, Ser. No. 596,440**
**Claims priority, application Japan, Apr. 7, 1983, 58-61422**
**The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.**
**Int. Cl.[4] G01N *21/88***
**U.S. Cl. 356—237** **9 Claims**



1. An apparatus for inspecting a planar translucent substrate for the presence of a foreign substance and/or a scar thereon, comprising:

(a) irradiating means for obliquely introducing a light beam onto one surface of said substrate;
(b) means for mutually displacing said irradiating means and said substrate in such a manner that the incident point of said light beam on said substrate scans said one surface;
(c) first photoreceptor means positioned to face said one surface of said substrate and adapted to receive a part of the light randomly scattered at said substrate to generate a corresponding first electric output signal;
(d) second photoreceptor means positioned to face the other surface of said substrate and adapted to receive another part of the light randomly scattered at said substrate to generate a corresponding second electric output signal;
(e) comparator means for comparing said first and second electric output signals to discriminate which of predetermined plural relationships is satisfied by the mutual relationship of said first and second electric output signals and to generate a discrimination output signal; and
(f) means for identifying the condition of said substrate according to the discrimination output signal of said comparator means.

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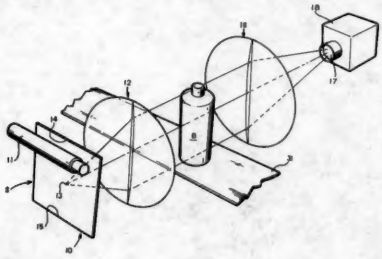
**4,610,542**

## SYSTEM FOR DETECTING SELECTIVE REFRACTIVE DEFECTS IN TRANSPARENT ARTICLES

**James A. Ringlien, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Nov. 16, 1984, Ser. No. 672,036**
**Int. Cl.[4] G01N *21/90***
**U.S. Cl. 356—240** **6 Claims**



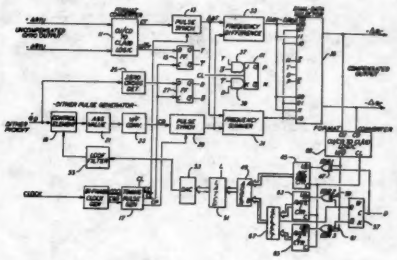
**1**. In a method of inspecting transparent objects for defects wherein a generally planar diffuser acts as a source of diffuse light is positioned at the focal length F of a lens thereby producing, in front of the lens, collimated beams that originate from points on the source and the angular spectrum of illumination in front of the lens is limited to angles which are equal to or less than the angle between a line extending from the upper edge of the diffuser through the center of the lens and the central axis of the lens, and objects to be inspected are positioned normal to the lens axis in front of the lens, optically enhancing defects in the object, the improvement therein comprising back lighting the diffuser so as to produce a light intensity gradient on the diffuser which is vertical in direction, thereby providing grey scale illumination for discriminating types of these defects from gradual refractive variations, and viewing the objects with a linear array camera focused on the surface of the object to detect defects by variations in the level of light received by the camera.

**4,610,543**

## ELECTRONIC DITHER COMPENSATOR FOR A RING LASER GYRO

**Lincoln S. Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.**

**Filed Apr. 3, 1985, Ser. No. 719,856**
**Int. Cl.[4] G01B *9/02***
**U.S. Cl. 356—350** **20 Claims**



**1**. In a dithered ring laser gyroscope having an uncompensated output indicative of rotation rate, the improvement comprising:
(a) a velocity pickup for sensing dither;
(b) an electronic dither compensator comprising:
(i) an automatic gain control element receiving as an input the output of the dither pickoff and providing an output;
(ii) a voltage-to-frequency converter having its input coupled to the output of said automatic gain control element providing an output pulse train proportional to dither rate; and
(c) means to combine the output of said voltage-to-frequency converter with the uncompensated input from the gyro to remove the effect of dither on said uncompensated output.

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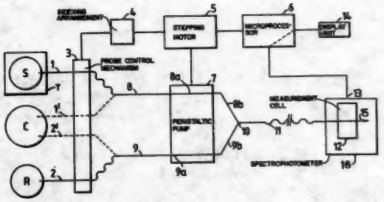
**4,610,544**

## FLOW ANALYSIS

**Clifford Riley, Terracotta, Wellhouse Lane, Burgess Hill, Sussex RH15 OBN, United Kingdom**

**Continuation of Ser. No. 300,660, Sep. 9, 1981, Pat. No. 4,486,097. This application Jul. 9, 1984, Ser. No. 615,826**
**The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.**
**Int. Cl.[4] G01N *35/08*; G01J *3/00***
**U.S. Cl. 356—410** **2 Claims**



**1**. A method of analysis of a liquid sample which is carried along a flow channel by a carrier liquid, which method comprises introducing a predetermined quantity of a given sample and a predetermined quantity of a selected reagent into respective separate sample and reagent flow lines by aspiration from separator containers, the sample being aspirated by a movable hollow probe, bringing the extracted sample and the extracted

reagent together into a common flow channel, and causing the combined sample and reagent to travel along said flow channel to a measurement cell, the sample and reagent being caused to flow along the flow channel by a pump, and after the predetermined quanitities of sample and reagent have been aspirated, (a) transferring the hollow probe while pump action is momentarily stopped to receive flow of a carrier liquid whereafter the pump is re-started and (b) transferring the reagent flow line during the time the pump action is momentarily stopped to receive flow of a carrier liquid, whereby the sample and reagent are caused to travel along said flow channel as a discrete liquid slug interposed in a stream of carrier liquid.

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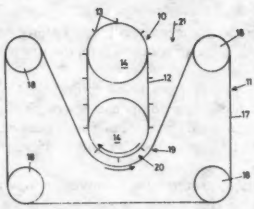
**4,610,545**

## MIXER

**Robert K. Tomlinson, Woodville, Australia, assignor to Monier Limited, Woodville, Australia**

**Filed Jul. 2, 1984, Ser. No. 626,699**
**Claims priority, application Australia, Jul. 5, 1983, PG0135**
**Int. Cl.[4] B28C *5/00***
**U.S. Cl. 366—2** **27 Claims**



1. A method of mixing concrete comprising the steps of;
providing a lug belt having elastomeric lugs outstanding from one surface thereof and oriented more in one transverse direction than the other, the belt being carried on horizontal roller drums;
providing a base belt carried by other horizontal drums and freely depending between two of those other roller drums to form a catenary portion extending below the other horizontal drums;
disposing the lug belt into the catenary portion of the base belt to form a mixing zone between the lug belt and the base belt;
introducing concrete ingredients into the mixing zone formed between said catenary portion and said lug belt;
and driving at least some of the roller drums to cause the belts to move in opposite directions, while at the same time traversing the mixed concrete ingredients across the mixing zone with respect to the direction of belt travel, by impingement of the transversely oriented lugs on the concrete ingredients.

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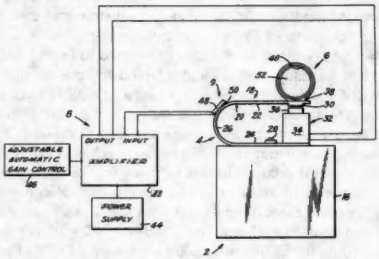
**4,610,546**

## APPARATUS AND METHOD FOR SELF-RESONANT VIBRATIONAL MIXING

**Julius Intraub, Plainview, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.**

**Filed Dec. 31, 1984, Ser. No. 688,032**
**Int. Cl.[4] B01F *11/00***
**U.S. Cl. 366—110** **16 Claims**

1. A self-resonant, non-invasive vibrational mixing apparatus for the mixing of materials comprising, vibrator means, container means for the materials to be mixed, means for mounting said container means on said vibrator means, driver means operatively associated with said vibrator means and operable to drivingly vibrate the same and said container means to mix the materials in said container means, control means operatively associated with said driver means and operable to control the frequency at which said driver means vibrate said vibrator means and said container means, and sensor means operatively associated with said vibrator means and said control means and operable to sense the frequency of said vibrator means and said container means and to operate said control means in response thereto to maintain the frequency of vibra-




tion of said vibrator means and said container means at or near the resonant frequency thereof whereby, said vibrator means and said container means will be vibrated at or near the resonant frequency thereof despite changes in the mass of materials in said container means.

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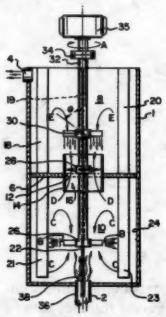
**4,610,547**

## PARTICULATE MATERIAL IN A LIQUID

**Adam J. Bennett; C. Edward Capes; William L. Thayer, all of Ottawa, and Floyd N. Toll, Gloucester, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada**

**Filed Jul. 8, 1985, Ser. No. 752,851**
**Claims priority, application Canada, Jul. 30, 1984, 459959**
**Int. Cl.[4] B01F *5/12, 7/16***
**U.S. Cl. 366—270** **3 Claims**



1. Apparatus for dispersing particulate material in a liquid, comprising:
(a) an upwardly extending cylindrical container having particulate-material-and-liquid inlet means to a lower end portion of the interior thereof and a particulate-material-and-liquid dispersion outlet from an upper end portion of the interior thereof,
(b) an annular partition dividing the container interior into upper and lower compartments with a central opening therebetween,
(c) a cylindrical duct forming a passageway for particulate-material-and-liquid passing through the central opening,
(d) particulate-material-and-liquid flow obstructing baffles in the upper and lower compartments, the baffles being at spaced intervals around, and spaced from, the inner sur-

face of the container, each of the baffles extending upwardly along a major intermediate portion of the compartment within which it is disposed to disrupt boundary layer flow therearound,

(e) a radial flow producing flat blade type turbine rotor coaxially disposed in the lower compartment and at an intermediate position between the particulate-material-and-liquid inlet means and the partition,

(f) a particulate-material-and-liquid homogenizing knife blade type turbine rotor coaxially disposed at an intermediate position in, and closely fitting in, the duct,

(g) a particulate-material-and-liquid radially outward an axially downward flow producing, pitched blade type turbine rotor coaxially disposed in the upper compartment at an intermediate position between the partition and the particulate-material-and-liquid dispersion outlet, and

(h) means for connecting the rotors to a driving means for rotating the rotors.

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**4,610,548**

## HOMOGENIZER

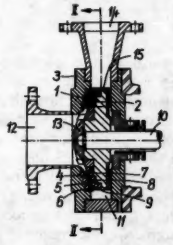
**Peter Hallet, Bergisch-Gladbach; Erwin Hess, Hückelhoven-Baal, and Hans-Jürgen Mertens, Grevenbroich, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

**Filed Nov. 19, 1984, Ser. No. 673,046**

**Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342304**

**Int. Cl.⁴ B01F *5/12***

**U.S. Cl. 366—279** **6 Claims**




1. In an apparatus for producing emulsions or suspensions, and including a rotary homogenizer having a housing in which is disposed a rotary rotor; the end face of the rotor being provided with collars having apertures therein; these collars being arranged to rotate between other collars which are disposed in a similar manner on said housing; said housing having an axial inlet which, while leaving a gap, opens centrally against said end face of said rotor; said housing also having a radially disposed outlet;

the improvement in combination therewith which comprises means that form free cross-sectional areas in said collars of said rotor and said housing via said apertures of said collars, with said free cross-sectional areas being constant from collar to collar; an annular free space being provided surrounding said collars; and a baffle element additionally inserted in said free space and extending over the entire depth, i.e. the axial dimension, thereof, said combination attaining an increase in conveying capacity without any worsening of homogenizing effect of said rotary homogenizer.

**4,610,549**

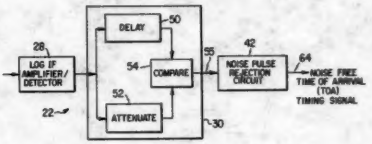
## METHOD AND APPARATUS FOR GENERATING A TIMING SIGNAL IN A TIME-OF-ARRIVAL DETECTION SYSTEM

**Dennis D. King, Sandy, and David F. Dautel, W. Bountiful, both of Utah, assignors to E-Systems, Inc., Dallas, Tex.**

**Filed May 6, 1985, Ser. No. 730,560**

**Int. Cl.⁴ G04F *8/00***

**U.S. Cl. 368—113** **8 Claims**




1. A pulse-type time-of-arrival detection system for detecting an input signal including at least one pulse, comprising:

receiver means for receiving said input signal and generating an output signal proportional thereto;

detector means connected to said receiver means for receiving said output signal, and in response thereto generating first time-of-arrival detector outputs due to noise from said receiver means, and a second time-of-arrival detector output upon detection of the leading edge of said pulse, each of said first time-of-arrival detector outputs having a substantially shorter period than the period of said second time-of-arrival detector output; and

means, triggered by said first and second time-of-arrival detector outputs, for generating a timing signal having first and second logic states, said timing signal normally changing from said first logic state to said second logic state after a predetermined time period "T," said time period "T" substantially longer than the period of each said first time-of-arrival detector outputs, such that said timing signal remains in said first logic state when said means is triggered by said first time-of-arrival detector outputs, but changes to said second logic state in said predetermined time period "T" when said means is triggered by said second time-of-arrival detector output.

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**4,610,550**

## WATCH HAVING A CASE PROVIDING AN INTEGRAL BOTTOM-PLATE STRUCTURE

**Ernst Thomke, Granges, and Jacques Müller, Reconvilier, both of Switzerland, assignors to ETA S.A. Fabriques d'Ebauches, Granges, Switzerland**

**Filed Jul. 5, 1984, Ser. No. 628,055**

**Claims priority, application Switzerland, Jul. 8, 1983, 3755/83**

**The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.**

**Int. Cl.⁴ G04B *37/00***

**U.S. Cl. 368—281** **20 Claims**

1. A watch case for housing a display means for displaying time and a movement means for providing said time, said case providing an exterior outline for a watch and comprising:

a bezel plate having at least a portion made of a transparent material for viewing said display means and an outer edge portion providing part of said exterior outline;

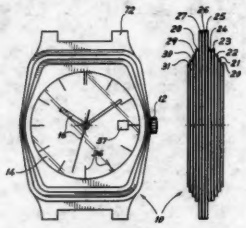
at least one display plate having an opening for housing at least part of said display means and an outer edge portion providing part of said exterior outline;

at least one movement plate having an opening for housing at least part of said movement means and an outer edge portion providing part of said exterior outline;

a back plate having an outer edge portion providing part of said exterior outline; and,

means for securing said plates together in a stack so as to provide a case structure;

said bezel plate and said back plate being the outermost plates of said stack and arranged to close off the front side and the back side, respectively, of said case structure;



said at least one display plate and said at least one movement plate being substantially flat and stacked one on top of another; and,

said at least one movement plate and said back plate being integrally secured together by said securing means so as to provide an integral bottom-plate structure for mounting at least part of said movement means.

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**4,610,551**

## ULTRASONIC TEMPERATURE SENSOR

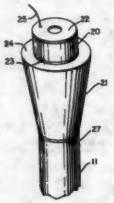
**Kirti C. Shah, North Billerica, Mass., assignor to General Electric Co., Schenectady, N.Y.**

**Division of Ser. No. 574,790, Jan. 27, 1984, Pat. No. 4,541,732. This application Jul. 1, 1985, Ser. No. 749,963**

**The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.**

**Int. Cl.[4] G01K** *11/22*

**U.S. Cl. 374—117** **8 Claims**



1. An ultrasonic temperature measuring arrangement comprising:

(a) a transducer for producing torsional waves;

(b) a wave guide coupled to said transducer for transmitting torsional waves from said transducer along its outer surface;

(c) the outer dimension of said wave guide being smaller than the outer dimensions of the transducer;

(d) transitional coupling means between said transducer and said wave guide for coupling the torsional wave from the larger outer dimension of the transducer to the smaller outer dimension of the wave guide, said means including a tapered mounting element supporting said transducer on its large end and contacting said wave guide at its smaller end, the dimensions of its smaller end being the same as the outer dimensions of said wave guide;

(e) temperature sensing means coupled to said wave guide, said temperature sensing means being fabricated of material having a torsional modulus dependent on temperature, said temperature sensing means being positioned in a medium whose temperature is to be measured,

(f) a discontinuity in said temperature sensing means for reflecting a portion of the torsional wave from said wave guide to produce a first pulse, said discontinuity defining the beginning of a sensing path fabricated of the material having a temperature dependent torsional modulus, the remaining torsional energy being transmitted over said path and reflected from the end thereof to produce a second pulse whereby the time interval between said pulses is proportional to the temperature,

(g) mounting means for said wave guide positioned at the nodal points of the torsional waves transmitted along the surface of said wave guide,

(h) means coupled to said transducer means for measuring the time interval between the pulses reflected back from the discontinuity and the end of the temperature sensing means for producing an electrical signal representative of the temperature being measured.

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**4,610,552**

## TEMPERATURE SENSOR FOR CABLES

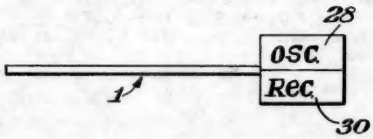
**Satoru Kobayashi; Yoshiaki Sato, both of Iruma, and Haruo Imaizumi, Ohmiya, all of Japan, assignors to Junkosha Company Ltd., Tokyo, Japan**

**Filed Jul. 9, 1984, Ser. No. 629,256**

**Claims priority, application Japan, Sep. 9, 1983, 58-139638**

**Int. Cl.[4] G01K** *11/08;* **G01R** *31/08*

**U.S. Cl. 374—160** **5 Claims**




1. A temperature sensor system comprising a temperature-sensing cable having a metal conductor having a low-melting point, a fibrous insulating layer arranged adjacent said low-melting-point conductor separating said low-melting point conductor from another conductor arranged adjacent and substantially parallel to said low-melting-point conductor, an oscillator applying pulsed electrical signal waveforms at a selected location of said temperature-sensing cable, and at least one receiver at a second selected location of said cable for receiving said pulse signal waveforms appllied to said temperature-sensing cable, thereby sensing changes in said temperature-sensing cable due to temperature changes which cause distortion of said low-melting-point conductor by a change in the signal waveform received by said receiver.

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**4,610,553**

## LEAF SPRING UNIT FOR A DOT MATRIX PRINTER

**Makoto Yasunaga, and Tsutomu Ikehata, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Oct. 3, 1984, Ser. No. 657,195**

**Claims priority, application Japan, Oct. 8, 1983, 58-156611[U]; Oct. 8, 1983, 58-188898**

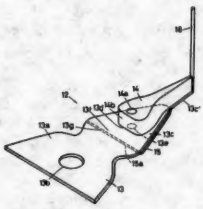
**Int. Cl.[4] B41J** *3/10*

**U.S. Cl. 400—124** **5 Claims**

1. An improved leaf spring unit for a dot matrix printer, having a leaf spring cantilevered on a supporting member at a base end portion, an armature secured to a first side of a free end portion of said leaf spring and having an armature surface facing said base end portion, and a wire secured to an end of the armature opposite to said armature surface, a core for producing a magnetic field for attracting said leaf spring, wherein the improvement comprising:

a reinforcement member coextensive with a portion of said leaf spring and secured to a second side of said free end portion of said leaf spring opposite to said armature so as to be adjacent to the core,

said reinforcement member having a thinner thickness than said armature and extending from an edge surface facing



toward said leaf spring base end portion toward the free end of said leaf spring,

said edge surface of said reinforcement member being closer to said base end portion than any portion of said armature surface so as to reinforce said leaf spring adjacent to said armature surface.

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**4,610,554**

## INK COMPOSITION AND WIRE DOT PRINTER INCLUDING SAME

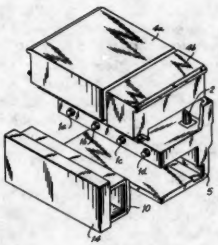
**Takashi Suzuki; Makoto Matsuzaki; Masanao Matsuzawa, and Yoshinori Miyazawa, all of Shiojiri, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan**

**Filed Dec. 21, 1984, Ser. No. 684,554**

**Claims priority, application Japan, Dec. 23, 1983, 58-243544; Apr. 4, 1984, 59-67285**

**Int. Cl.[4] B41J** *3/12;* **C09D** *11/00*

**U.S. Cl. 400—124** **16 Claims**



1. A non-aqueous ink composition comprising:

(a) about 2–20% by weight of at least one dyestuff selected from the group of an oleaginous dyestuff and a water soluble dyestuff;

(b) about 80% by weight of at least one polyhydric alcohol compound selected from the group of polyhydric alcohols and derivatives thereof; and

(c) about 3–10% by weight of a water soluble amine wherein the viscosity of the composition is between 20–70 centipoise at 20° C., the pH is between 8–11 in a 20% aqueous solution and the surface tension is between 30–50 dyn/cm.

**4,610,555**

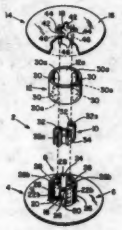
## UNIVERSAL RIBBON SPOOL FOR TYPEWRITERS AND OTHER MACHINES

**Eugene Di Luco, 1760 Miriam St., North Brunswick, N.J. 08902**

**Filed Dec. 20, 1984, Ser. No. 683,928**

**Int. Cl.[4] B65H** *75/02*

**U.S. Cl. 400—243** **1 Claim**



1. A universal spool for ribbons comprising,

a. a base member including, a first flange member, and a centrally disposed annual hub having an inner wall and an outer wall, said inner wall defining an opening extending end to end therethrough,

b. spline means disposed on said outer wall of said annular hub,

c. an annular ribbon holder having an inner wall defining an opening extending end to end therethrough and positioned about said hub,

d. restraining means disposed on the inner wall of said ribbon holder for engagement with said spline means to prevent rotation of said ribbon holder about said hub,

e. resilient spool adapter means positioned entirely within the opening of said hub and having a central section which defines a central opening,

f. a first connector means disposed on the inner wall of said annular hub having at least one pair of posts, each post being positioned diametrically opposite the other post of said at least one pair of posts, and each post having an aperture arranged in the axial direction of said hub,

g. at least two diametrically opposed gripping members disposed on said spool adapter means for mating engagement with said at least one pair of said posts, said mating engagement preventing substantial relative rotation between said annular hub and said resilient spool adapter means,

h. a closure member including, a second flange member, and a second connector means centrally disposed on the closure member said closure member retaining said resilient spool adapter means within said opening of said hub, and

i. said second connector means having at least one pair of pins disposed for mating engagement with the aligned apertures in said at least one pair of posts to fixedly connect said closure member to said base member such that the first and second flange members are arranged in spaced parallel relation.

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**4,610,556**

## WRITING INSTRUMENT WITH PLURAL TIPS

**Kuo-Lung Tsai, 4F. 27 Lane 160, Hsin Sheng S. Rd., Sec. 1, Taipei, Taiwan**

**Continuation-in-part of Ser. No. 543,163, Oct. 18, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,440**

**Int. Cl.[4] B43K** *27/00*

**U.S. Cl. 401—18** **7 Claims**

1. A combination writing instrument comprising:

a pen holding means having an ink reservoir at the rear and a common capillary tube means at the front;

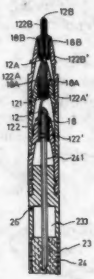
a mother nib device, which includes a writing point, an ink inducing member connected with said writing point and a

nib body holding said writing point and an air vent provided at said nib body, detachably fitted at the front of said pen holding means;

a pluralilty of sub-nib devices, one of which is capped on the front portion of said mother nib device, each said sub-nib device including a writing point, an ink inducing member immediately connected with said writing point and a nib body holding said writing point and an air vent provided at said nib body;

each of said ink inducing members of said mother nib device and said sub-nib devices having an ink conducting member of lower density than the corresponding ink inducing member provided immediately at the rear end thereof;

wherein ink will flow from said ink reservoir to the writing point of said mother nib device through said common capillary tube means, the ink conducting member of said mother nib device and the ink inducing member of said mother nib device and further guiding ink to the writing points of the front-most sub-nib device through the writing point of said mother nib device, the ink conducting members, the ink inducing members and the writing points of said subnib devices, positioned between said mother nib device and said front-most sub-nib device; said ink inducing members and said ink conducting members of said nib devices being made of a beam of synthetic filaments with longitudinal orientation, said filaments contained inside both said ink inducing members and said ink conducting members being oriented in a straight direction as that of ink flow, characterized in that




(a) the front end of said capillary tube means is substantially inserted into the rear portion of said ink conducting member of said mother nib device;

(b) the writing point of said mother nib device is substantially inserted into the rear end portion of said ink conducting member of said sub-nib device immediately and successively positioned in front of said mother nib device;

(c) the writing point of said sub-nib device immediately and successively positioned in front of said mother nib device is further substantially inserted into the rear end portion of the next successively forward sub-nib device, so that a plurality of sub-nib devices are positioned in a form of head-to-tail configuration in front of said mother nib device;

(d) all of said filaments contained inside said ink conducting members and ink inducing members are fully encased by a tubular casing to limit outward expansion thereof when the front end of said capillary tube means or the writing points of said nib devices is substantially inserted thereinto;

(e) the density of said synthetic filaments of said ink conducting member and ink inducing member provided in said sub-nib device positioned immediately in front of said mother nib device is greater than that of the synthetic filamemts of the ink conducting member and ink inducing member provided in said mother nib device, respectively;

(f) the density of the synthetic filaments of the ink conducting member and ink inducing member provided in the next successively front sub-nib device is greater than that of the synthetic filaments of the ink conducting member and ink inducing member provided in said sub-nib device immediately in front of said mother nib device, respectively; whereby the density of the synthetic filament of the ink conducting member and ink inducing member provided in any one of the successively forward sub-nib devices positioned farther from said capillary tube means is greater than that of the synthetic filament of the ink conducting member and ink inducing member of said sub-nib device positioned nearer to said capillary tube means, respectively; and

(g) the density of the rear end portion of each said ink conducting member is greater than that of the remaining portion thereof and a flexible orifice is formed in each of the rear end portion of said ink conducting member of said nib devices to thereby serve a suction function with said inserting front end of said capillary tube means or said inserting writing point of said mother nib device or sub-nib devices to enable ink to induce only from the direction of said capillary tube means to the writing point of said nib devices through their respective ink conducting member and ink inducing member to prevent ink feeding back to said capillary tube means when the entire writing instrument is positioned upsidedown to ensure constant and uniform ink flow from said ink reservoir to the writing point of the frontmost sub-nib device for immediate and smooth writing.

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**4,610,557**

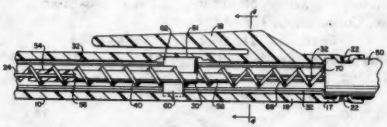
## MECHANICAL PENCIL WITH GROOVE AND LUG STRUCTURE

**Curtis L. Malm, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.**

**Continuation of Ser. No. 578,734, Feb. 9, 1985, abandoned. This application Jun. 24, 1985, Ser. No. 747,587**

**Int. Cl.**[4] **B43K** *21/08, 21/06*

**U.S. Cl. 401—75** **3 Claims**



**1.** A mechanical pencil adapted for low-cost, mass production and providing simplified assembly procedures comprising a hollow barrel member carrying a plurality of longitudinal grooves on the inner wall thereof spaced apart from each other, a tip rotatably mounted on the barrel member, a helical spring member located axially within the barrel member and a lead advance-retract mechanism comprising a body having forward and rearward ends, said forward end including a lead holding bore to frictionally retain an end portion of a length of lead whereby the remaining portion of the length of lead can extend coaxially through the helical spring from the lead holding bore to the tip, said rearward end carrying a plurality of solid lugs projecting outwardly from the body and spaced apart from each other about the body, one of said lugs including a lead portion defined by an extention extending toward said forward end and where the extension is spaced apart from the body of the advance-retract mechanism along the entire length of the extension so that said advance-retract mechanism is positioned within the helical spring and the helical spring passes between the extension and the body of the advance-retract mechanism and where the spacing between the longitudinal grooves and the lugs carried by the rearward end of the advance-retract mechanism is arranged so that insertion of the lead portion into one of the grooves simultaneously aligns the other lug in another groove and where relative movement between the barrel and tip members is converted to longitudi-

nal movement of the lead advance-retract mechanism by virtue of cooperation between the lugs and grooves.

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**4,610,558**

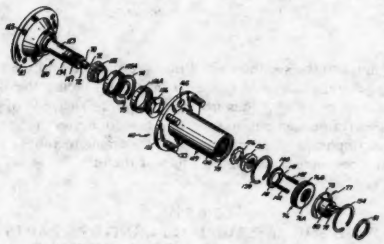
## SELECTIVELY FREE WHEELING OR DRIVE HUB FOR VEHICLES

**Mervin L. Erickson, 930 Dakota Ave. South, Huron, S. Dak. 57350**

**Continuation-in-part of Ser. No. 532,287, Sep. 15, 1983, Pat. No. 4,555,197. This application Nov. 15, 1985, Ser. No. 798,699**

**Int. Cl.[1] F16D *1/06*; B60B *27/00***

**U.S. Cl. 403—1** **7 Claims**



1. An adapter assembly for mounting on an automobile driving axle and for receiving an automobile wheel to permit selective free rotation of the wheel comprising:

(a) an axle assembly comprising a mounting flange and a shaft, said shaft extending substantially perpendicularly away from said mounting flange, said shaft including a stem on the end opposite said mounting flange and a splined portion positioned inwardly from and adjacent to said stem;

(b) a hub rotatably mounted on said shaft comprising a wheel flange having bolts for receiving a wheel and a sleeve having a splined portion along an inner surface;

(c) a drive member having a central opening and being axially slidably mounted on said shaft and within said sleeve, the perimeter of said opening having splines which cooperate with said splined portion of said shaft and the outer circumference of said drive member having splines which cooperate with said splined portion of said sleeve, said drive member being axially movable between a first drive position, wherein said drive member is engaged with said splined portions on both said sleeve and said shaft, and a second free wheeling position wherein said drive member is disengaged from one of the splined portions;

(d) spring means mounted within said sleeve for urging said drive member axially to its second freewheeling position;

(e) a cap axially slidably mounted on said stem of said shaft and within said sleeve and movable to force said drive member axially against the urging of said spring means and into its first drive position; and

(f) means for selectively locking said cap on said stem in the position holding said drive member in its first drive position.

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**4,610,559**

## SHIELD FOR UNIVERSAL JOINT

**Roger D. Mayhew, Fredonia, and B. Bennett Reak, West Bend, both of Wis., assignors to Weasler Engineering, Inc., West Bend, Wis.**

**Filed Apr. 12, 1985, Ser. No. 722,341**

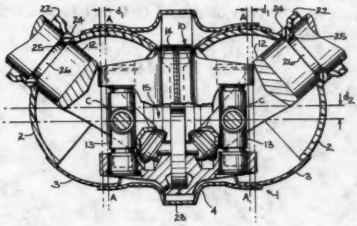
**Int. Cl.[4] F16B *11/00*; F16D *3/00***

**U.S. Cl. 403—23** **2 Claims**

1. In a double universal joint having two yokes pivotally connected by respective cross-links to a double inner housing, a shield comprising:

a pair of opposed, hemispherically shaped bell elements opening toward the joint, each of said bell elements being axially fixed to one of said yokes and having a center spaced-apart from the center of the other bell element;

a pair of frusto-spherically shaped shoes, each of said shoes slidably overlapping one of said bell elements and being concentric therewith;



a boot spanning said shoes with each shoe being rotatably disposed between its associated bell element and said boot, said boot being solely supported by the shoes and free to rotate independent of the joint; and

wherein said shoes float upon said bell elements within said boot to fully enclose the universal joint as the joint is articulated.

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**4,610,560**

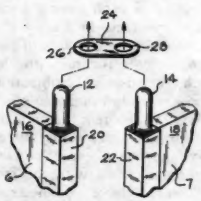
## PANEL DISPLAY CONNECTOR

**Melvin M. Miller, Bloomington, Ind., assignor to Channel-KOR Systems Inc., Bloomington, Ind.**

**Filed Feb. 22, 1984, Ser. No. 582,488**

**Int. Cl.[4] F16C *11/04***

**U.S. Cl. 403—119** **1 Claim**



1. A display device connector system comprising a plurality of U-shaped channels which support the display, connector plugs which are locked into the uppermost ends of said U-shaped channels and a connector plate having a plurality of apertures therein, said apertures are adapted to receive connector plugs which are positioned in outboard U-shaped channels of adjacent displays;

said display device comprises at least two base sections and at least two display sections, which are positioned on top of said base sections;

said U-shaped channels have inner surfaces which incorporate three sides and a pair of opposing lips which define a rectangular aperture;

said connector plugs have a round end and a rectangular end with a threaded bore therein for receiving a set screw which biases said plug member against said pair of opposing lips, the rectangular ends of said connector plugs being secured into said U-shaped sections;

the uppermost portion of the U-shaped channels incorporated in the base sections have connector plugs secured therein which connector plugs are adapted to receive corresponding U-shaped channels which are an integral pat of the display section;

wherein adjacent base sections and display sections are secured to each other via connector plates the apertures of

which are positioned over the round end of said connector plugs.

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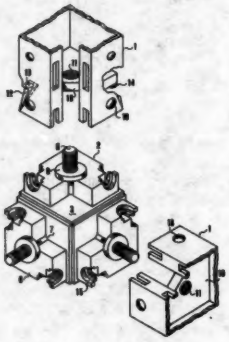
**4,610,561**

## SECTIONAL STRUCTURE FOR CARPENTRY, PARTICULARLY TO REALIZE CUBICLES

**Sergio Cecchellero, Milan, and Daniele Salvatore, Cusano Milanino, both of Italy, assignors to Italtel Tecnomeccanica S.p.A., Terni, Italy**

**Filed Dec. 31, 1984, Ser. No. 687,981**
**Int. Cl.[4] E04H *14/00***
**U.S. Cl. 403—171** **9 Claims**



**1.** In a sectional structure for forming corner joints of cabinetry, particularly adapted to produce cubicles, of the type comprising a plurality of bars joined through screws to a plurality of joints, these latter each having a substantially cubic body, wherein only three faces locating a trihedral angle are formed with respective plug-type shanks of a generally polyhedral shape complementary to the inner profile of the bars, the improvement which comprises in combination with the cubic body a plurality of screws and plates in said bars threadedly receiving the screws, and wherein the cubic body is solid and in its center area is formed with a cavity which communicates with any of the six faces via a respective clearance hole, the clearance holes communicating with the faces of the cubic body providing said shanks have a diameter not less than that of shanks of said screws and an end coinciding with said cavity provide such an enlarged diameter as to create a seat adapted to receive heads of the screws, the clearance holes communicating with the faces of the body not formed with said plug-type shanks having a diameter not less than that of said heads of said screws, said plates being rigidly fixed in said bars and being flat, rigid and formed with threaded holes adapted to receive and traversed by the shanks of said screws, said elements being disposed and held inside the bars at distances from the ends thereof not less than the heights of said plug-type shanks.

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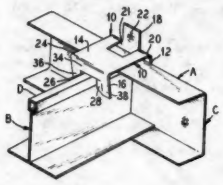
**4,610,562**

## PERIMETER CLIP

**James J. Dunn, Carpentersville, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.**

**Filed Aug. 29, 1985, Ser. No. 770,742**
**Int. Cl.[4] B25G *3/00*; F16B *7/08***
**U.S. Cl. 403—233** **10 Claims**

**1.** A clip for securing an elongated frame member of a suspended ceiling to a perimeter member having a flat surface extending substantially perpendicular to the elongated frame member, said clip comprising a flat flap for placement against the flat surface of the perimeter member, a linking web portion having one end connected to one edge of the flap and a second end spaced from the one end and means for gripping the elongated frame member attached to the second end and including a flange extending at an angle to said web portion with the flap, web portion and flange forming a substantially U-shaped member, said flange having a pair of tabs bent on fold lines out of the plane of the flange to form a slot extending substantially at



right angles to the second end of the web portion and the tabs having gripping edges facing each other and facing the flap, said pair of gripping edges gripping opposite surfaces of the elongated frame member inserted into the slot between the tabs and coacting to prevent movement of the frame member away from the perimeter member and flap of the clip.

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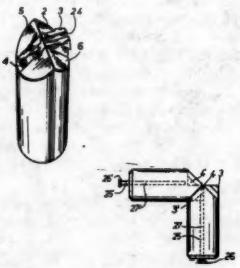
**4,610,563**

## DOWEL FOR ASSEMBLING FURNITURE PARTS

**Steen Ostergaard, 16 Jahnsensvej, Gentofte DK-2820, Denmark**

**PCT No. PCT/DK83/00090, § 371 Date May 31, 1984, § 102(e) Date May 31, 1984, PCT Pub. No. WO84/01410, PCT Pub. Date Apr. 12, 1984**
**PCT Filed Sep. 28, 1983, Ser. No. 618,395**
**Claims priority, application Denmark, Oct. 5, 1982, 4416/82**
**Int. Cl.[4] F16B *12/36, 13/04***
**U.S. Cl. 403—295** **7 Claims**



**1.** A dowel for assembling adjacent ends preferably of furniture parts **(28)** and constructed in such a manner that is is capable of being fastened in a bore of the individual furniture part, the dowel comprising an exposed head **(2)** constructed to engage an adjacent head **(2)** of a similar dowel of another furniture part **(28)** where the head **(2)** of the dowel comprises a protruding part **(3)** as well as a receiving part **(4)**, said parts being shaped so that the protruding part **(3)** of the dowel may be snapped into the receiving part **(4)** of a similar dowel and be maintained substantially immovable therein, and where the head **(2)** is tapered so that it comprises substantially two plane surfaces **(5, 6)** forming an angle with respect to such other and intersecting immediately adjacent to the middle of the head **(2)**, the protruding part **(3)** and the receiving part **(4)** being associated with respective plane surfaces **(5,6)** and being each of such a shape that the corresponding plane surface **(5,6)** abuts the plane surface **(6,5)** of the corresponding part of the other similar dowel, the receiving part **(4)** being constituted by a centrally located, radial, rectangular aperture which is formed in the corresponding plane surface **(5)** extending from the intersection of the two plane surfaces **(5, 6)** and which leads in-

wardly into the inner cavity (20) of the dowel, and the protruding part (3) being of a corresponding, substantially rectangular shape with a corresponding, central location on its adjacent plane surface (6), the protruding part (3) at the other end comprises an enlargement adapted to be received in the inner cavity (20) of a corresponding dowel.

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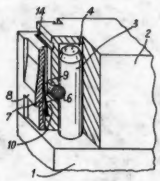
**4,610,564**

## DEVICE FOR GUIDING AND LOCKING THE COUPLING OF A CONNECTOR

**Patrick Vantouroux, Fleury les Aubrais, France, assignor to Compagnie Deutsch, France**

**Filed Oct. 3, 1984, Ser. No. 657,391**
**Int. Cl.[4] B25G *3/00*; F16D *1/00***
**U.S. Cl. 403—316** **9 Claims**



**1.** A device for guiding and locking first and second mating parts of a connector, comprising:

a guidance column attached to and extending outwardly from said first connector part, said column having a notch therein, said notch being spaced a predetermined distance from the end of said column;

a guidance column receiver integral with said second connector part, said receiver having a recess shaped and having an axial orientation so as to cooperate with said column in closely fitting relationship;

a resiliently biased cylindrical roller in a slot located in a wall of said receiver, said roller being mounted transversely to said axial direction of said receiver, said roller being movable between a locking position in which it penetrates into said recess to a depth close to that of said notch and a coupling position in which said roller withdraws from said recess; and

a locking member slidably mounted on said receiver, said member being movable between an unlocked position in which a spring connected to said locking member resiliently urges said roller into said recess, and a locked position in which a stop surface on said locking member prevents said roller from disengaging said notch in said column.

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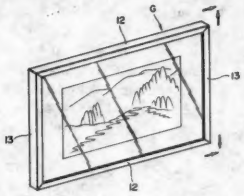
**4,610,565**

## DEVICE FOR JOINING FRAME MEMBERS FOR PICTURE FRAME

**Toshikazu Nakayama, No.11-3, Inokashira 1-chome, Mitakashi, Tokyo, Japan**

**Filed Apr. 15, 1985, Ser. No. 723,469**
**Claims priority, application Japan, Aug. 31, 1984, 59-132308**
**Int. Cl.[4] F16B *12/50***
**U.S. Cl. 403—402** **1 Claim**

**1.** A device for joining frame members of a picture frame of the type comprising an upper frame member, a lower frame member, a pair of side frame members and four L-shaped joining members, each frame member being integrally formed with a laterally extended groove and a dovetail groove with a ridge extending longitudinally on the lower surface of said dovetail groove, and each joining member including handles with cam surfaces pivotably attached to said joining member



and an inverted groove extending longitudinally on the lower surface of said joining member.

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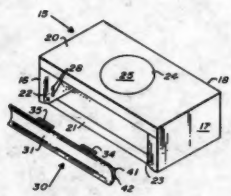
**4,610,566**

## CURB INLET WITH REMOVABLE GUTTER FORM

**Nicholas P. Albang, Rohnert Park; Gary L. Lindsay, Petaluma, and Daniel F. Foster, Corte Madera, both of Calif., assignors to Phoenix Simpton Company, San Francisco, Calif.**

**Filed Apr. 9, 1985, Ser. No. 721,188**
**Int. Cl.[4] E01C *11/22***
**U.S. Cl. 404—4** **11 Claims**



**1.** A curb inlet including in combination:

a concrete member having a rear wall, side walls, each said side wall having at least one bolt-receiving opening near its forward face, and a top wall with an access opening therethrough,

a concrete access cover removably fitting in said access opening, and

a removable non-concrete gutter form comprising an arcuate, generally rectangular strip having a concave front face and a convex rear face with a plurality of handles secured to said rear face and, also secured to that rear face, a plurality of aligning horizontal sleeves each having a tube portion and a latch portion and each having a locking bolt slidably mounted in said sleeves, said locking bolt being extendable beyond the edge of said form and retractable to within the area of said form, said bolts being spaced to conform to the spacing of the bolt-receiving openings in said side walls and used to secure the form in its pouring position, so that the form can be locked in place by the bolts entering said bolt-receiving openings, said form then retaining concrete when the concrete is poured, and after the concrete sets, by withdrawing the bolts from the bolt-receiving openings, the form can be removed from said concrete member taken out through said access opening for reuse in installation of another curb inlet.

**11.** A method of installing a curb inlet,

a precast concrete member having a rear wall, side walls, each said side wall having a pair of recessed openings near its forward face, and a top wall with an access opening therethrough capable of receiving a removable concrete access cover, the steps of securing to said precast member a thin removable gutter form comprising an arcuate, generally rectangular strip with a concave front face and a convex rear face and with a pair of handles secured to said rear face and, also secured to that rear face, a pair of

aligning horizontal sleeves with a tube portion and a latch portion and with locking bolts slidably mounted in said sleeves, said securing being done by extending said locking bolts beyond the edge of said form into said recessed openings,

installing said precast member into position for pouring concrete around it, with the gutter form retained by said locking bolts extending into said retained openings,

pouring concrete to provide curb and a gutter, said form helping to shape a portion of said gutter,

after the poured concrete has set, retracting the bolts and sliding them to a position within the edge of the form, and

then removing the form through said access opening for reuse in another curb inlet.

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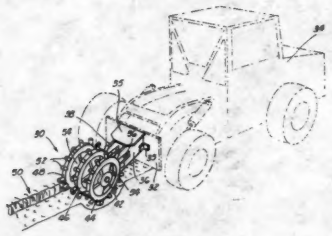
**4,610,567**

**TRENCH COMPACTION DEVICE**

**Raymond E. Hosking, 4331 S. Arbutus Way, Morrison, Colo. 80465**

**Filed Jul. 18, 1984, Ser. No. 631,910**
**Int. Cl.[4] E01C *19/26***
**U.S. Cl. 404—121** **4 Claims**



**1.** A trench compaction device adapted for mounting on construction type equipment and the like, the compaction device comprising:

a mounting bracket used for quick-disconnect of the attachment of the compaction device to the equipment;

a first frame having a first end and a second end, the first end attached to the bracket;

a second frame having a first end and a second end, the first end attached to the bracket, the second frame parallel to the first frame;

an axle rotatably mounted on the second ends of the first and second frames, the frames having a centerline along their length and through the center of the axle;

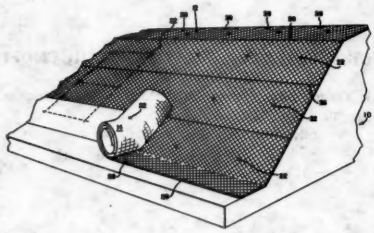
a first compaction wheel, a second compaction wheel and a third compaction wheel, the wheels rotatably mounted on the axle, the first and third compaction wheels mounted on opposite ends of the axle with the second compaction wheel disposed between the first and second frames, the first frame and the second frame having an upper edge and lower edge along the length thereof, the upper edge and lower edge extending outwardly from the bracket and parallel to the centerline of the frame, the upper edge as it approaches an area adjacent an outer periphery of the wheels extending upwardly at an angle $\phi$ and continuing at this angle to the second end of the frame, the lower edge extending outwardly from the bracket and parallel to the centerline of the frame, the lower edge, as it approaches an area adjacent an outer periphery of the wheels, extending downwardly at an angle $\phi$ and continuing at this angle to the second end of the frame, the first and second frames supporting the wheels with the edges of the frames acting to clean and remove fill dirt as the wheels are rotated thereon.

**4,610,568**

**SLOPE STABILIZATION SYSTEM AND METHOD**

**Robert M. Koerner, 533 E. Springfield Rd., Springfield, Pa. 19064**

**Filed Mar. 28, 1984, Ser. No. 594,365**
**Int. Cl.[4] E02D *17/20***
**U.S. Cl. 405—19** **20 Claims**



**1.** A retaining system for stabilizing the potential slip zone of a slope which overlies a stable earth region comprising:

(a) a layer of geosynthetic fabric covering the potential slip zone of the slope; and

(b) anchoring means for compressing the potential slip zone of the slope between said fabric layer and the underlying stable earth region, including:

(i) a plurality of anchoring rods driven through the potential slip zone of the slope into the underlying stable earth region;

(ii) said anchoring rods deployed in a substantially equally spaced array; and

(iii) means for coupling said anchoring rods to said fabric layer whereby said anchoring rods extend from said layer of fabric into the underlying stable earth region and the potential slip zone of the slope is compressed between said fabric layer and the underlying stable earth region.

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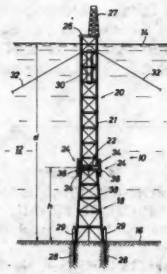
**4,610,569**

**HYBRID OFFSHORE STRUCTURE**

**Lyle D. Finn, and Leo D. Maus, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.**

**Filed Jul. 30, 1984, Ser. No. 635,942**
**Int. Cl.[4] E02B *17/00;* E02D *5/00***
**U.S. Cl. 405—202** **19 Claims**



**1.** An articulated offshore structure for use in a body of water, said structure comprising:

a substantially rigid lower section, said lower section extending upwardly from the bottom of said body of water to a pivot point located intermediate the bottom and the surface of said body of water;

a compliant upper section extending upwardly from said

pivot point to a position at or above the surface of said body of water;

pivot means located proximate said pivot point, said pivot means interposed between and connected to said lower section and said upper section and adapted to permit said upper section to pivot laterally relative to said lower section;

torsion means connected to said upper section and said lower section, said torsion means adapted to transmit torsional loads from said upper section to said lower section;

said pivot means being positioned above the bottom of said body of water a distance of between about 10 percent and about 50 percent of the total depth of said body of water so as to substantially minimize the weight of said structure while maintaining the flexural vibration period of said structure at or below a preselected maximum flexural vibration period.

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**4,610,570**

## MARINE ANCHORS

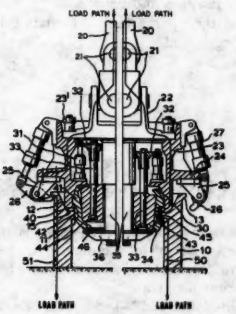
**Brian R. Brockway, Bournemouth, United Kingdom, assignor to Vickers Public Limited Company, London, United Kingdom**

**Filed Nov. 4, 1985, Ser. No. 794,383**

**Claims priority, application United Kingdom, Nov. 27, 1984, 8429920**

**Int. Cl.[4] E02D *5/74*; B63B *21/50***

**U.S. Cl. 405—224** **10 Claims**




1. A coupling for anchoring an end of a thether, comprising an anchor chamber having at a mouth thereof an out-turned flange and an inturned flange, a connector for termination of the tether having a flange that abuts the inturned flange of the anchoring chamber, a collet having a groove into which said inturned flange and said connector flange lock to establish a primary load path from said anchoring chamber to said tether, locking fingers carried by said connector and surrounding the mouth of said anchoring chamber, and actuator means operable to engage said locking fingers with said out-turned flange, thereby establishing a secondary load path between said anchoring chamber and said tether that is effective when said coupling is being established or released.

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**4,610,571**

## FOUNDATION SYSTEM AND PILE COUPLING FOR USE THEREIN

**Ralph J. Lees, Scarborough, Me., assignor to Braman, Dow and Company, Boston, Mass.**

**Filed Oct. 15, 1985, Ser. No. 787,060**

**Int. Cl.[4] E02D *5/16***

**U.S. Cl. 405—251** **19 Claims**

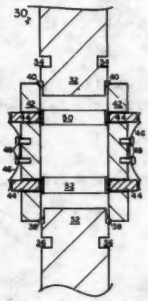
1. Coupled piling bars for use in forming a load-bearing support for a structural foundation, which coupled piling bars comprise:

(a) a first piling bar and a second piling bar, the first and second piling bars each having a one and another end, the one end of the first bar and the other end of the second bar characterized by a retainer-cavity means spaced apart from the end of the bar, and a retainer-ring-receiving groove means at the one end of the first bar and at the other end of the second bar and adapted to receive within the groove a retainer ring; and

(b) a pile bar coupling means to secure together the one end of the first pile bar and the other end of the second pile bar in an axially aligned, contacting, load-bearing coupled relationship, which coupling means comprises

(i) an outer housing means adapted to be fit slidably in a snug manner over the one end of the first bar and the second end of the second bar,

(ii) first and second retainer means spaced apart from each



other in the housing means and adapted to move from a biased unlocked position to a locked position,

(iii) tensioning means to bias inwardly the first and second retainers toward the center of the coupling means, and

(iv) first and second retainer-ring means within the housing means and positioned to retain respectively the first and second retainers in an open, tensioned, unlocked position, whereby, on insertion of the one end of the first pile bar and the other end of the second pile bar into the housing, the first and second retainer rings are received within the retainer-ring-receiving groove, through the axial inward motion of the first and second bars, and, on contact of the first and second bars, the tensioned retainer means are positioned in the retainer-cavity means, to lock together the first and second bars in an end-to-end contacting coupled relationship.

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**4,610,572**

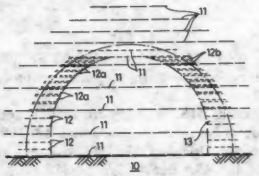
## METHOD OF BUILDING STRENGTHENED EMBANKMENT BODY

**Kazuo Horimatsu, Funabashi, Japan, assignor to Tekken Construction Co., Ltd., Tokyo, Japan**

**Filed Aug. 29, 1985, Ser. No. 770,563**

**Int. Cl.[4] E21D *9/00***

**U.S. Cl. 405—258** **7 Claims**



1. A method of building a strengthened embankment body for constructing a new road in which a tunnel is to be exca-

vated, the method comprising the steps of embanking required material for constructing the new road while horizontally burying a plurality of first nets which are vertically spaced from each other, and preparing in said body being embanked a semicylindrical zone capable of being tunneled, said preparing step including a step of forming, during said embanking step, an arch-shaped strengthened body part corresponding to an arc-shaped peripheral wall part of said semicylindrical zone, said step of forming said arch-shaped strengthened body part including further steps of preparing embanking material highly compression-resistant, and burying a plurality of second nets with said highly compression-resistant embanking material between said second nets, said second nets buried in said arch-shaped wall part of said zone being vertically spaced and between said respective first nets, at a density increased as they approach the top of the arch of the strengthened body part and having respectively a width substantially equal to the width of the strengthened body part.

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**4,610,573**

## TUNNELING MACHINE

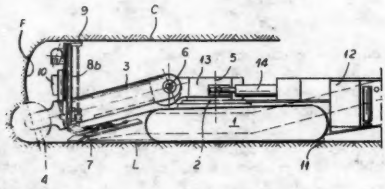
**Friedrich W. Paürat, Kasselweg 29, 4230 Wesel 1, and Roland Paürat, Blumenstrasse 11, 4230 Wesel 13, both of Fed. Rep. of Germany**

**Filed Aug. 1, 1985, Ser. No. 761,571**

**Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428358**

**Int. Cl.⁴ E21D *20/00***

**U.S. Cl. 405—259** **7 Claims**




1. A tunneling machine comprising:

a mobile and automotive base movable on the ground horizontally and longitudinally toward a face to be cut away;

a turntable on the base defining an upright pivot axis and having a main support pivotal about the axis on the base;

an arm having an inner end pivotal about a horizontal axis on the main support and having an outer end;

a cutter on the outer end of the arm;

a conveyor having an intake on the ground between the base and the cutter and extending back away from the face;

means including actuators connected between the cutter, arm, support, conveyor, and base for moving the cutter over the face to cut rock therefrom and for conveying the cut rock back away from the face;

a drilling apparatus carried on the arm and engageable with the ceiling immediately adjacent the face, the cutter being engageable with the floor to support the arm thereon while the drilling apparatus is boring in the ceiling.

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**4,610,574**

## CATALYST FEEDING SYSTEM

**Edwin F. Peters, Winfield, Ill., assignor to Amoco Corporation, Chicago, Ill.**

**Division of Ser. No. 615,186, May 30, 1984, abandoned, which is a continuation of Ser. No. 407,848, Aug. 13, 1982, abandoned.**

**This application Jan. 17, 1985, Ser. No. 692,268**

**Int. Cl.⁴ B65G *53/30*; B01J *8/08***

**U.S. Cl. 406—50** **5 Claims**

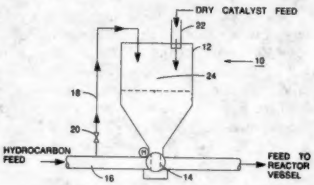
1. An apparatus for transferring a known quantity of a mixture of dry catalyst and a hydrocarbon liquid, comprising:

a hydrocarbon feed conduit;

an enclosed mixing tank having an outlet in a lower portion thereof and connected to said hydrocarbon feed conduit;

means for introducing dry catalyst into the interior of the mixing tank;

a bypass conduit in communication with the hydrocarbon feed conduit upstream of the mixing tank and in communication with the interior of the mixing tank so that the interior of the mixing tank is maintained at the pressure of




a hydrocarbon liquid flowing through the hydrocarbon feed conduit;

a shot valve spaced below the mixing tank and rotatable from a first position in communication with the outlet in the mixing tank to a second position in communication with the hydrocarbon feed conduit;

means for rotating the shot valve from the first position to the second position and back; and

means within the mixing tank for mixing dry catalyst and hydrocarbon liquid.

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**4,610,575**

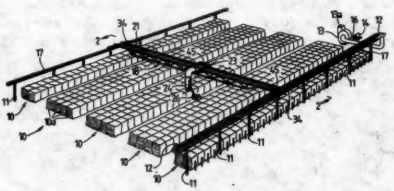
## APPARATUS FOR REMOVING QUANTITIES OF FIBER FROM BALES FOR BLENDING PURPOSES AND THE LIKE

**Donald W. Van Doorn; James B. Hawkins; William A. Harmon; Terry L. McKenzie, all of Columbus, Ga., and Michael A. Hollingsworth, Phenix City, Ala., assignors to Lummus Industries, Inc., Columbus, Ga.**

**Filed Jul. 5, 1984, Ser. No. 628,038**

**Int. Cl.⁴ B65G *53/14***

**U.S. Cl. 406—113** **9 Claims**



1. In apparatus for removing quantities of staple fiber or like material from a plurality of differing units of the same such as bales located adjacent each other on a horizontal surface,

(a) a horizontal stationary material conveying air duct,

(b) a horizontal traveling material conveying air duct associated with the stationary air duct into which material collected into the traveling air duct is delivered, and

(c) material pick-up means having a discharge movable along the length of and associated with the traveling duct, whereby material from the plurality of bales may be moved from the bales into the pick-up means thence into the traveling and stationary air ducts.

4,610,576

## SINGLE-TOOTH CUTTER FOR SLOPING THE FACES OF THE TEETH OF GEARS

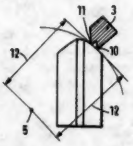
Manfred Erhardt, Puchheim, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,561

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329697

Int. Cl.[4] B23F *21/00*

U.S. Cl. 407—21 8 Claims




1. In a single-tooth cutter for sloping the axially facing end faces of teeth of gears by a hob-milling method, said cutter being rotatably supported for movement about an axis of rotation, and having thereon a cutting tooth with a cutting edge means spaced radially outwardly from said axis of rotation, said cutting edge means extending along a side of said cutting tooth which faces said axis of rotation of said cutter for effecting a working, during successive rotations of said cutter, at least one sloped surface on said axially facing end faces of said teeth on said gears, the improvement comprises wherein said cutting edge means includes plural cutting edges, and wherein at least two individual cutting edges follow one another in a peripheral direction of said cutter and lie on the same flight circle.

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4,610,577

## GEAR OR RACK-SHAPED TOOL FOR PRECISION MACHINING OF TOOTH FLANKS PARTICULARLY OF HARDENED GEARS

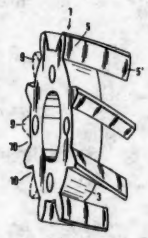
Johann Spensberger, Poing, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,813

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346190

Int. Cl.[4] B23F *21/00*

U.S. Cl. 407—27 3 Claims




1. In a gear or rack-shaped precision finishing tool for precision finishing of tooth flanks, particularly of hardened gears, including a tooth base member of metal having a coating which includes grains of a hard material such as cubic boron nitride (CBN) or diamond covering each tooth flank of said base member, the improvement comprising wherein said base member of said tool includes two halves on which each second tooth is removed to thereby provide sufficient space for the even application of said coating on the circumferentially facing sides of each of said tooth flanks of the remaining teeth, the remaining teeth each having a pair of oppositely circumferentially facing involute tooth flanks separated at the radial extremity by a land surface, said tooth flanks and land surface extending axially beyond said one side of said base member a distance which is approximately half of their length, said base members being oppositely directed and connected to each other so as to be fixed against relative rotation, wherein said axially projecting teeth of each half are disposed between the teeth of the other half, and wherein connecting means are provided for connecting said two halves together.

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4,610,578

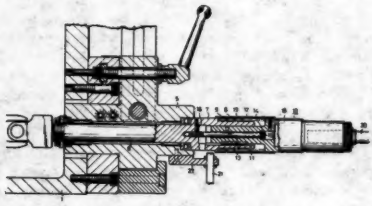
## HOLE MACHINING DEVICE

Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Co., Ltd., Seki, Japan

Filed Aug. 29, 1983, Ser. No. 527,409

Int. Cl.[4] B23B *49/00*

U.S. Cl. 408—13 3 Claims



1. A hole machining device comprising:

driving shafts (6) mounted to the body (1) of the hole machining device,

spindles (10) acting to install drills (20) and supported by the shafts (6) so that the spindles can move longitudinally back and forth relative to the shafts while rotating together with the shafts (6),

means for rotating said driving shafts, whereby said spindles and drills are also rotated,

springs (19) interposed between the spindles (10) and the driving shafts (6) to invariably urge the spindles longitudinally (10) forward throughout the entire range of longitudinal movement of the spindles relative to the shafts, including the fully advanced positions of the spindles, said spindles being free for said longitudinal movement whenever the load on the spindles exceeds the opposing force of said springs,

spindle collars (17) covering the springs (19) and installed over the spindles (10), said spindles collars being secured to said spindles and telescoping over the adjacent portions of said driving shafts to permit longitudinal movement of said spring collars along with said longitudinal movement of said spindles, and

detecting means for detecting the rearward movement of the spindle collars (17).

4,610,579

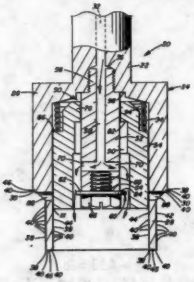
## CORE DRILL BIT WITH DYNAMIC COOLING FLUID FLOW CONTROL MEANS

Robert G. Frank, Murrysville; Joseph A. Noca, Irwin, both of Pa.; Joseph B. Kelly, Crestline, and Robert L. Bowers, Bellville, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 615,975, May 31, 1984, Pat. No. 4,541,758. This application May 9, 1985, Ser. No. 732,124

Int. Cl.[4] B23B *51/04, 51/06*

U.S. Cl. 408—60 20 Claims



1. A bit for a core drill of the type for drilling a chamfered hole in an article, comprising:

a body having an inner bore, drilling surfaces, a chamfering surface, at least one radial opening, and an inner chamber disposed in fluid communication with said inner bore;

a lubricating fluid flow directing means disposed within said inner chamber and having a dynamic component reciprocably movable between first and second positions;

wherein in said first position said dynamic component is positioned to permit flow of a lubricating/cooling fluid from said inner bore to at least the article portion to be drilled and said drilling surfaces; and

wherein in said second position said dynamic component is positioned to permit flow of the lubricating/cooling fluid from said inner bore through said at least one opening provided through said bit body to at least the article portion to be chamfered and said chamfering surface to at least minimize thermal damage to the article.

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4,610,580

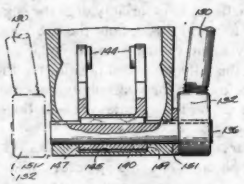
## DRILL FEED HANDLE

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Apr. 8, 1985, Ser. No. 720,858

Int. Cl.[4] B23B *39/10*

U.S. Cl. 408—136 5 Claims



1. A power tool having a housing including spaced side walls and having a base,

a motor in said housing,

a rotary cutting tool driven by said motor and movable toward and from the work,

means controlling movement of said tool toward and from the work, comprising,

a shaft journaled in said side walls and having a length somewhat greater than the distance between said walls so one end will project a given distance beyond one wall when the other end of the shaft is substantially flush with the other wall,

said shaft being axially movable so either end can be made to project from the associated wall,

a sleeve fitting over said shaft between said walls,

a key drivingly connecting said sleeve and said shaft while permitting axial movement of the shaft relative to the sleeve,

limit means to limit axial movement of the shaft relative to said sleeve,

said sleeve being operatively connected to said tool to move said tool as said shaft rotates,

a collar having an axial length substantially equal to said given distance and connected to the end of said shaft which projects beyond said wall, and

a handle connected to said collar.

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4,610,581

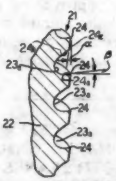
## END MILL AND METHOD

Joseph Heinlein, Oak Forest, Ill., assignor to Lambert Consolidated Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 396,756, Jul. 9, 1982, abandoned. This application May 31, 1984, Ser. No. 615,671

Int. Cl.[4] B23C *5/10*

U.S. Cl. 409—132 15 Claims



7. A method of milling a workpiece with an end mill having an elongate cylindrical shaft provided at an upper end with a shank for chucking the end mill in a milling machine spindle, and equipped with flutes providing helical cutting edges extending from said shank and running out at an opposite lower end of the shaft, said method comprising:

providing said cutting edges with a helix pitch angle of from 10° to 30° and thoughout the length of each of the cutting edges providing a concave rake surface sloping toward said lower end and away from the cutting edge and merging with an upsweep surface leading into an overhang surface;

operating said end mill in center thrust cutting relation to the workpiece;

and in such operating of the end mill causing said cutting edges and said surfaces to cooperate to cut from the workpiece and form tightly curled substantially straight elongated chips substantially as long as the depth of cut in the workpiece.

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4,610,582

## ROLLER HOLD DOWN DEVICE

James R. Amos; Chester K. Greathouse, and David S. Riddle, all of McMinnville, Tenn., assignors to Stanwich Industries, Inc., Greenwich, Conn.

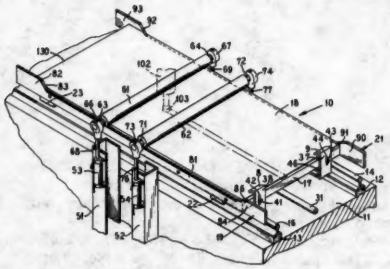
Filed Jun. 5, 1985, Ser. No. 741,352

Int. Cl.[4] B23B *47/00*

U.S. Cl. 409—163 9 Claims

1. A roller hold down device for a longitudinally movable work table mounted on a base to hold a workpiece thereto

comprising, a first roller which extends transversely of said movable work table, a first pair of roller support means mounted to said opposite sides of said base and rotatably sup-



porting said roller so as to flexibly bias said roller against said workpiece, and a first cam means attached to said movable table and engageable with said roller adjacent one end of said work table to lift it out of engagement with said workpiece.

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**4,610,583**

**HORIZONTAL DRILLING AND MILLING MACHINE**

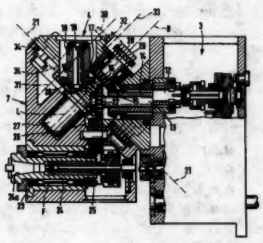
**Matthias Malzkorn, Jüchen, and Helmut Holz, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Scharmann GmbH & Co., Munchen Gladbach, Fed. Rep. of Germany**

**Filed Mar. 1, 1985, Ser. No. 707,091**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411647**

**Int. Cl.[4] B23C *1/12*; B23B *39/14***

**U.S. Cl. 409—211** **4 Claims**



1. A horizontal drilling and milling machine, which has a spindle head which can be rotated about an axis set at 45° relative to a horizontal plane; said spindle head, which carries a rotatable spindls sleeve, can be arrested by means of a support housing in horizontal and vertical working positions of said spindle sleeve; a gear system, which includes a drive shaft rotatably mounted in said support housing, drives said spindle sleeve; said drilling and milling machine further comprises:

means for rotating said spindle head about an axis of rotation thereof in a rotational movement relative to said support housing, with said means being drivingly connectable to said drive shaft for deriving motive power therefrom; said means for rotating said spindle head including a shaft which effects the rotational movement of said spindle head, and also including an axially, longitudinally movable coupling gear by means of which said drive shaft can be selectively coupled with, and uncoupled from, said shaft which effects the rotational movement of said spindle head.

**4,610,584**

**HORIZONTAL DRILLING AND MILLING MACHINE HAVING A SPINDLE HEAD WHICH CAN BE ROTATED ABOUT AN AXIS SET AT 45 DEGREES TO THE HORIZONTAL**

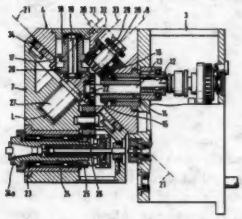
**Matthias Malzkorn, Jüchen, and Helmut Holz, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Scharmann GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany**

**Filed Mar. 1, 1985, Ser. No. 707,095**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407679**

**Int. Cl.[4] B23C *1/12***

**U.S. Cl. 409—211** **9 Claims**



1. A horizontal drilling and milling machine, which has a spindle head which can be rotated about an axis set at 45° relative to a horizontal plane; said spindle head, which carries a rotatable spindle sleeve, can be arrested by means of a support housing in horizontal and vertical working positions of said spindle sleeve; said drilling and milling machine further having the improvement therewith which comprises:

drive means arranged to drive said spindle sleeve in a horizontal working position differently at a higher rotating speed during horizontal operation than a lower rotating speed during vertical operation to drive said spindle sleeve in a vertical working position; said drive means including a spur gear system for rotatably driving said spindle sleeve in its horizontal working position at the higher rotating speed; and

said drive means also including a bevel gear system for rotatably driving said spindle sleeve in its vertical working position at the lower rotating speed likewise attainable along with said spur gear drive system producing less wear and developing less noise and heat in the more frequently used horizontal working position of said spindle sleeve.

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**4,610,585**

**CHUCK FOR USE WITH A CUTTING TOOL**

**Günther Fellmeth, Rechberghausen, and Willi Jester, Herten-Westerholt, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

**Filed Sep. 7, 1983, Ser. No. 530,083**

**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233133**

**Int. Cl.[4] B23C *9/00*; B23B *31/10***

**U.S. Cl. 409—233** **9 Claims**

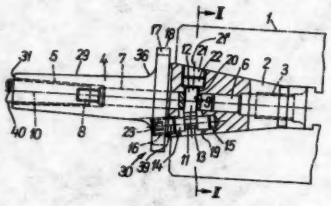
1. A chuck adapted to be clamped into a spindle of a machine tool and adapted for use with a cutting tool having a shaft with a circular cross section which is provided with an internal tightening thread, comprising:

a body having a front side and a rear side and being provided with a central bore having an outwardly conically widening end region at said front side for receiving the shaft of the cutting tool; a shaft portion forming part of said body and extending toward said rear side and configured to be clamped into the spindle of the machine tool; and a further bore contained in said shaft portion;

a clamping screw disposed in the further bore of said shaft

portion being provided with a radially constricted region and having a head accessible from the direction of said front side;

a pull rod displaceably disposed in the central bore and having a threaded end extending into the end region of the central bore for connection to the shaft of the cutting tool; and



attachment means which includes a fork which passes around said constricted region of said clamping screw for coupling said pull rod to said clamping screw for causing displacement of said pull rod in said central bore in the direction of said rear side by said clamping screw upon tightening thereof.

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**4,610,586**

**APPARATUS FOR DEBURRING OF WORKPIECES**

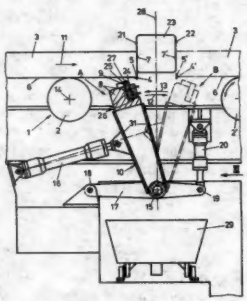
**Rudolf Langeder, Mauthausen, Austria, assignor to Voest-Alpine Internation Corporation, New York, N.Y.**

**Filed Sep. 20, 1984, Ser. No. 652,263**

**Claims priority, application Austria, Oct. 13, 1983, 3650/83**

**Int. Cl.[4] B23D *1/22***

**U.S. Cl. 409—300** **21 Claims**



1. An apparatus for the deburring of work pieces comprising

a frame;

means to support a work piece;

a swivel drive disposed on the frame;

a support lever pivoted at one end on the frame and providing a swivel axis located intermediate between the two ends of the support lever;

means for moving the support lever engaging the support lever at the other end of the support lever;

a rocker arm rotatable around said swivel axis and movable by the swivel drive;

a knife having an edge and mounted at the rocker arm where the length of the knife edge corresponds at least to the length of an edge of the work piece to be deburred, where the rocker arm can be moved past the edge of the work piece to be deburred, where the position of the knife edge versus the edge to be deburred is adjusted by changing the location of the swivel axis of the rocker arm by moving the support lever, and where the swivel axis of the rocker arm is directed about parallel to the edge to be deburred.

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**4,610,587**

**REUSABLE TWO-PIECE FASTENER**

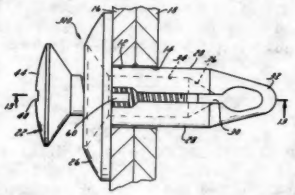
**Burnell J. Wollar, Barrington, Ill., and Richard J. Schwind, Akron, Ohio, assignors to Phillips Plastics Corporation, Phillips, Wis.**

**Continuation of Ser. No. 565,534, Dec. 27, 1983, abandoned.**

**This application Mar. 7, 1986, Ser. No. 838,191**

**Int. Cl.[4] F16B *13/06***

**U.S. Cl. 411—60** **1 Claim**



1. A reusable two-piece fastener for insertion into an aperture in at least one panel and comprising a screw member and a body member:

said screw member comprising a screw shank, a screw head at one end of said screw shank, and a screw thread formed on said screw shank;

said body member comprising a body shank, a body head at one end of said body shank, a plurality of outwardly expandable resiliently flexible legs at the other end of said body shank, an integrally formed flexible hinge portion connecting the free ends of said legs, each pair of adjacent legs being separated by an axially extending slot, a bore extending axially through said body head and said body shank and intermediately of said legs, said bore being in communication with the slots between said legs, an inwardly sloped leg-expander ramp provided on the inner surface of each leg, outwardly movable resiliently flexible bore wall portions integrally formed on said body shank and located in the slots between said legs, a plurality of screw-engaging threads formed on an inner wall surface of each movable bore wall portion and extending radially inwardly into said bore, said screw-engaging threads being movable with said bore wall portions in radial directions relative to the axis of bore so as to facilitate axial sliding movement therepast of said screw thread of said screw member during axial insertion of said screw shank into said bore, each of said screw-engaging threads extending around only a part of the circumference of said bore and having the same pitch and spacing as said screw thread on said screw shank,

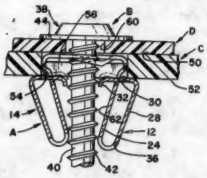
said screw shank being axially and slidably insertable into said bore past said screw-engaging threads to engage the leg-expander ramps and effect leg expansion and entrap said one panel between the expanded legs and said body head, said screw-engaging threads being operatively engageable with said screw thread on said screw shank to prevent sliding axial withdrawal of said screw shank of said screw member and to permit only rotational withdrawal thereof from said bore.

4,610,588

## FASTENER CLIP

Harold S. Van Buren, Jr., Concord, and Frederick A. Hammerle, Topsfield, both of Mass., assignors to TRW, Inc., Cleveland, Ohio

Filed Jul. 24, 1984, Ser. No. 633,827
Int. Cl.[4] F16B *37/02*
U.S. Cl. 411—173 17 Claims




1. A fastener clip adapted to receive an associated fastener, said clip comprising:

a head portion having an opening therethrough adapted to receive the shank of the associated fastener from adjacent one side of an associated workpiece; a pair of spaced apart legs integral with said head portion and extending outwardly from one face thereof; and, each leg including a first portion, a second portion bent back upon said first portion outwardly thereof, a finger portion disposed at a free end of said second portion extending inwardly toward and through an aperture in said first portion to a point sufficient to prevent inward deflection of said second leg portions when the shank of an associated fastener is received in said fastener clip, and a connecting zone intermediate said first and second portions, said connecting zones deflecting toward each other for applying a clamping force to the shank of an associated fastener extending therebetween when a tension laod is imposed on said clip generally normal to the plane of said head portion.

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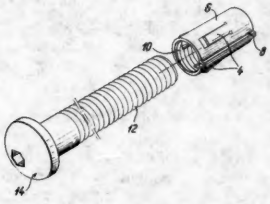
4,610,589

## SCREW ANCHORING BUSHING FOR USE IN SEMIHARD MATERIALS

Torben Bredal, Odense, Denmark, assignor to Tri-Bolt Fasteners ApS, Denmark

Continuation of Ser. No. 315,868, Oct. 28, 1981, which is a continuation of Ser. No. 943,934, Sep. 20, 1978, abandoned. This application Jun. 18, 1984, Ser. No. 621,465
Claims priority, application United Kingdom, Sep. 20, 1977, 39049/77
Int. Cl.[4] F16B *37/04*
U.S. Cl. 411—180 5 Claims




1. In a screw anchoring bushing of the type for use in elements of a semihard material such as chipboard, consisting of a substantially cylindrical metal sleeve body for insertion in a predrilled mounting hole in said element and threaded for cooperation with a tightening screw member, said sleeve body being provided with axially extending tongue portions operable to be swung outwardly in a barb-like manner in response to tightening of said screw member so as to intrude into the wall of the mounting hole and thereby obstruct retraction of the sleeve body, the improvement wherein the sleeve body is a threaded metal sheet member of pronounced material resiliency rolled through substantially 360° so as to bring opposite edges thereof into a mutually adjacent position, said tongue portions being provided as barbs bent outwardly from the sleeve body so as to be resiliently depressable inwardly towards the cylindric surface of the sleeve body, and wherein said edges are provided with axially extending outwardly bent edge strip portions which are operable to self-cut an axial receiving groove in the surface of said hole during insertion of said sleeve body into said hole so as to thereafter form a means for restricting both rotation of said sleeve body and opening expansion of said sheet member, whereby anchoring of said sleeve body is achieved essentially through spreading of said tongue portions during axial displacement of said sleeve body during tightening of said screw member.

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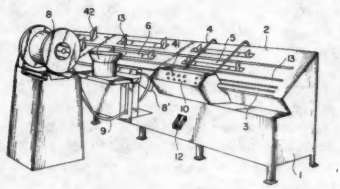
4,610,590

## AUTOMATIC PUNCHING AND WIRE COMB BINDING MACHINE

Daniele P. Pigna, Bergamo, Italy, assignor to Rilecart S.p.A., Nembro, Italy

Filed May 31, 1983, Ser. No. 499,718
Claims priority, application Italy, Jun. 4, 1982, 21715 A/82
Int. Cl.[4] B42B *5/10*; B42C *3/00*
U.S. Cl. 412—11 12 Claims

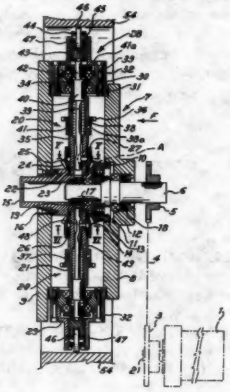



1. An automatic machine for perforating and comb binding blocks of sheets, which comprises: a support frame and cover, part of which cover, in the form of an inclined surface, provides support and feed surface for the sheets to be perforated and bound; a sheet perforating station comprising a vertically movable matrix of selectable punches; a reel for supplying comb binding element to the machine; a coupling station for engaging the perforated sheets with one or more portions of the comb binding element which is fed continuously from said reel of two independent feed members; an intermediate cutting member; said coupling station having associated therewith a known hook insertion device; press means of known type; means for conveying the blocks of sheets along said feed surface, said conveying means having associated tab means in proximity to said perforating and coupling stations and in a final discharge zone; cams for operating said tab means for positioning said blocks in front of said stations in correspondence with a stoppage of said conveying means, single motor means for controlling the motion of the conveying means, of said cams and of said punches; and an electronic programmer arranged to receive as input signals originating from detectors sensing the position of the blocks of the sheets, the position of said cams continuously operated by said motor means and the number of loops of the comb being fed, the programmer being able to actuate, as a function of at least one value preset on a selector unit, an operational sequence which controls the fed members of the binding comb, the cutting member, hook insertion, and the closure of the press.

## 4,610,591
## METAL BAR FEED CONTROL DEVICE FOR THE FEEDING OF AN AUTOMATIC MULTIPLE-SPINDLE LATHE

Giovanni Cucchi, and Pietro Cucchi, both of Bussero, Italy, assignors to F.lli Cucchi S.r.l., Bussero, Italy

Filed Apr. 19, 1984, Ser. No. 601,777
Claims priority, application Italy, Apr. 21, 1983, 20706 A/83
Int. Cl.[4] B23Q *5/22*
U.S. Cl. 414—14 19 Claims

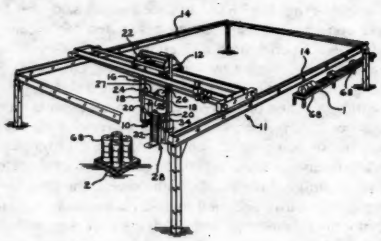


1. A bar-feed control device for the feeding of an automatic multiple-spindle lathe, including a drum that rotates together with equipment for guiding the bars to the lathe said drum having a series of units controlling the bar feed, each unit comprising a rotatable hollow shaft (**21**) carrying a drive gear (**36**) splined to its outer surface for rotation therewith, drive means (**24**) associated with said shaft, a pin (**39**) slidingly movable within said hollow shaft, means (**49**, **24***a*) for coupling said drive means to said shaft through the intermediation of said pin, and cam means (**54**) for moving said pin into a first position for connecting said drive means to said shaft through said coupling means and into a second position disengaging said coupling means from said drive means.

## 4,610,592
## ROBOTIC DOWNENDER APPARATUS

David J. Pienta, Temperance, Mich., assignor to Automatic Handling & Fabrication, Inc., Erie, Mich.

Filed Jan. 7, 1985, Ser. No. 689,470
Int. Cl.[4] B65G *57/28*
U.S. Cl. 414—38 8 Claims



1. An improved downender apparatus comprising, in combination:

means for receiving a plurality of unit loads;

means for moving said receiving means and such unit loads between a horizontal position and a vertical position;

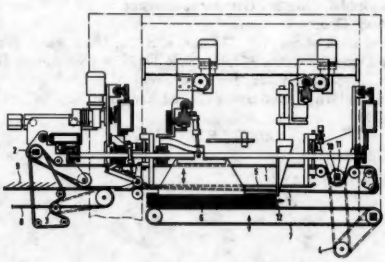
means for holding such unit loads when in such vertically stacked position; and,

means for removing said holding means from said unit loads, thereby leaving such unit loads in a vertically stacked position, said receiving means defining a planar surface, said holding means comprising an end member positioned substantially perpendicular to such planar surface of said receiving means and a frame assembly connected to said end member and pivotally connected to said receiving means, said removing means including a cylinder interconnected between said frame assembly and said receiving means for moving said frame assembly and said end member from a first position proximate said receiving means to a second position spaced from said receiving means, said end member being connected to said frame assembly by a hinge assembly, and a shock absorbing member positioned between said end member and said frame assembly, whereby said end member pivots with respect to said frame assembly as said frame member and said end member are moved outwardly from such first position to such second position spaced from said receiving means.

## 4,610,593
## DEVICE FOR CONVEYING AND STACKING SHEETS OF PAPER

Peter Voss, Jüchen, and Dieter Osburg, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,360
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317515
Int. Cl.[4] B65H *31/30*
U.S. Cl. 414—43 4 Claims



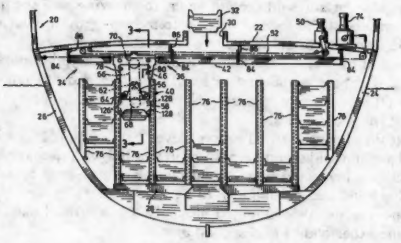
1. In a device for conveying and stacking sheets of paper having a first conveying unit receptive of sheets for stacking and a second conveying unit downstream of the first conveying unit for removing a stack, wherein the units include upper and lower belts, the improvement wherein a single upper belt is associated with two lower belts for the two units and comprising first coupling means which are engaged to simultaneously drive the upper belt and one of the lower belts at the same speed to effect stacking of the sheets and second coupling means which are engaged to simultaneously drive the upper belt and the other of the lower belts at the same speed to remove the stack, the first and second coupling means being alternately engaged to stack the sheets and then to remove the stack.

**4,610,594**

## CONTAINER CONVEYOR SYSTEM

**Raymond P. Lane, Burlington, Canada, assignor to Dominion Chain Inc., Stratford, Canada**

**Filed Jan. 7, 1985, Ser. No. 689,344**
**Int. Cl.[4] B63B *27/12*; B65G *57/03***
**U.S. Cl. 414—71** **8 Claims**



5. Structure for moving containers from a first location between parallel first uprights to a second location between parallel second uprights, the structure comprising:

a pair of tracks extending horizontally above the uprights;

a transporter having two cars movable along respective ones of the tracks, each car including a pair of guides extending vertically downwards for alignment with selected pairs of the uprights in proximity with the uprights to form continuations of the uprights; and

a hoist having two end assemblies adapted to be located in pairs of uprights and in the guides for movement vertically, each of the end assemblies being below a corresponding one of the cars, a beam attached at its ends to the end assemblies at the tops of the end assemblies, engagement means suspended from the beam for releasable connection to the containers, the beam being positionable between the cars with the elevator lifted to an uppermost position where the end assemblies are clear of the first upright and located between respective pairs of guides of the end assemblies so that the transporter can move horizontally to align the guides with the second uprights with a container between the guides whereby the hoist can then be used to lower the container with the end assemblies moving in the parallel second uprights.

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**4,610,595**

## CLOSED LOOP AUTOMATED WORKPIECE HANDLING SYSTEM FOR MACHINE TOOL

**Thomas F. Hockersmith, Tustin, and Donald E. Wile, Mission Viejo, both of Calif., assignors to Advanced Controls, Inc., Irvine, Calif.**

**Filed Feb. 22, 1985, Ser. No. 704,397**
**Int. Cl.[4] B65H *1/00***
**U.S. Cl. 414—222** **5 Claims**

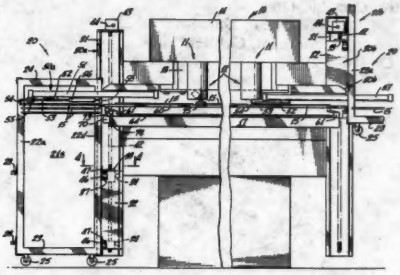
1. A machine tool system comprising:

an elongate machine tool having a longitudinally reciprocable worktable having a plurality of workstations spaced apart along the longitudinal direction of the worktable;

a first workpiece support structure for supporting a plurality of workpieces at one end of the machine tool adjacent a first workstation;

a feeder mechanism on the machine tool for drawing workpieces from the support structure to a first workstation of the machine tool; and

a transfer mechanism on the machine tool for shifting workpieces from the first workstation to an adjacent workstation, said transfer mechanism including (a) means for selectively elevating workpieces above said worktable and lowering workpieces onto said worktable, said elevating means connected to the worktable for reciprocable movement therewith, and (b) first grasping means for grasping workpieces when elevated and maintaining them in a fixed position while the worktable is shifted from the adjacent workstation to the first workstation, wherein the



workpieces are then released by the means for grasping and lowered onto the worktable in a new workstation.

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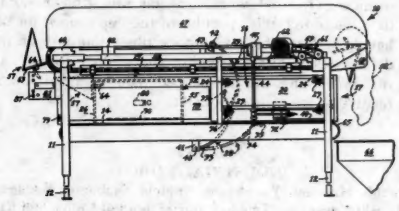
**4,610,596**

## APPARATUS FOR REMOVING COVER FROM BALED MATERIAL

**Floyd E. Bouldin; E. Lloyd Bouldin; Thomas E. Cantrell, and Floyd A. Pearsall, all of McMinnville, Tenn., assignors to Bouldin & Lawson, Inc., McMinnville, Tenn.**

**Filed Oct. 26, 1984, Ser. No. 665,282**
**Int. Cl.[4] B65G *69/00***
**U.S. Cl. 414—412** **12 Claims**



1. An apparatus for removing a flexible cover from a bale of material comprising:

(a) a loading station adapted to receive an elongated bale of material having a longitudinal axis, enclosed by a flexible cover having a front end, a rear end, top, bottom and opposed side walls, in a loading position;

(b) knife means spaced longitudinally of said loading station and in front of said loading position and adapted to cut through the flexible cover,

(c) a discharge station spaced in front of said knife means,

(d) pusher means for moving the covered bale of material,

(e) means for moving said pusher means longitudinally to engage the rear end of the bale in said loading station and to push the baled material through said knife means toward said discharge station, to cause said knife means to cut a slit in said front end and longitudinally through at least one of said walls, whereby after the bale cover is slit, the baled material is discharged from said slit bale cover at said discharge station,

(f) means for returning said pusher means to said loading station,

(g) said pusher means comprising prong means for impaling the cover on the baled material and for carrying the slit cover separated from the baled material from said discharge station back toward said loading station.

**4,610,597**

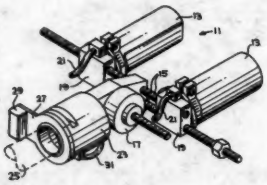
## GRIPPER INTERFACE FOR A ROBOT

**Allen J. Wright, Corvallis, Oreg., assignor to Intelledex Incorporated, Corvallis, Oreg.**

**Filed Oct. 6, 1983, Ser. No. 539,529**

**Int. Cl.[4] B66C** *1/00*

**U.S. Cl. 414—729** **1 Claim**



**1**. A gripper interface for a robot comprising,

a shaft having a driven end and a working end, the working end having means for seating a gripper coupler in a working position and a first bevel gear for transferring motion to the gripper coupler,

a gripper coupler, connected to the seating means of the shaft, having a clutch means for engaging the motion transfer means, the shaft having a movable member for controlling the clutch, said gripper coupler having mounting means for connecting a robot gripper thereto, and

a clutch having a cup-shaped member with an outwardly turned rim supported by an axial spring surrounding said cup-shaped member within the gripper coupler, the inner base of said cup-shaped member defining a second beveled gear capable of engaging the first bevel gear, the movable member of the shaft working against said spring to control the clutch, the outer portion of the cup-shaped member having surface ribs, said surface ribs fitting into grooves defined inside of a nut within said gripper coupler, said ribs preventing the cup-shaped member from rotating relative to the gripper coupler.

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**4,610,598**

## INDUSTRIAL ROBOT

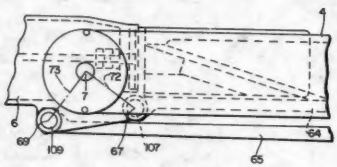
**Toyohide Hamada, Yokohama; Kouichi Sugimoto, Kanagawa; Hitoshi Kusakawa; Tatenori Jinriki, both of Chiba, and Kiyohide Koizumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 30, 1983, Ser. No. 527,863**

**Claims priority, application Japan, Aug. 30, 1982, 57-149320; Aug. 30, 1982, 57-149321; Aug. 30, 1982, 57-149322; Sep. 6, 1982, 57-153892**

**Int. Cl.[4] B25J** *18/00*

**U.S. Cl. 411—744 A** **37 Claims**



**15**. An industrial robot comprising:

a base,

a first arm having one end mounted pivotally about a first axis on said base and a pair of first and second levers to form a divided construction,

a second arm having one end mounted pivotally about a second axis on the other end of said first arm,

first drive means mounted on said base for providing power to said first arm,

second drive means mounted on said base for providing power to said second arm,

first power transmission means for moving said first arm about the first axis by transmitting the power of said first drive means to said first arm,

second power transmission means, mounted in between said first lever and said second lever, for moving said second arm about the second axis by transmitting the power of said second drive means to said second arm,

one end of each of said levers is being respectively pivoted to said base at the first axis and the other end of each of said levers being respectively pivoted to said second arm at the second axis,

said first lever and said second lever being pivoted to said base and said second arm to be in parallel with each other,

said first lever and said second lever being pivoted to said base and said second arm to be spaced apart,

a moving member mounted movably along a third axis on the other end of said second arm,

third drive means mounted on the one end of said second arm for providing power to said moving member, and

third power transmission means for moving said moving member along the third axis by transmitting the power of said third drive means to said moving member.

**32**. An industrial robot, comprising:

a base,

a first arm having one end mounted pivotally about a first vertical axis on said base,

a second arm having one end mounted pivotally about a second vertical axis on the other end of said first arm,

a first member mounted to be translationally movable along a direction of a third vertical axis on the other end of said second arm,

a second member mounted to be rotatable relative to said first member about said third vertical axis,

first drive means for driving rotatably said first arm, said first drive means having a first drive motor,

second drive means for driving rotatably said second arm, said second drive means having a second drive motor,

a third drive motor mounted on the said second arm for providing power to said first member,

a fourth driving motor mounted on said base for providing power to said second member,

first power transmission means for transmitting the rotating putput power of said third drive motor to said first member so that said second member moves with said first member along said direction of third vertical axis,

second power transmission means for rotating said second member about the third vertical axis by transmitting the rotating output power of said fourth drive motor to said second member, said second transmission means having a boss rotatably supported by a bearing provided on said other end of said second arm and said second member engages with said boss so that the boss prevents said second member form being turned but allows said second member to move only in the direction along said third vertical axis, and

a grip mounted on said second member to be movable in two dimensions.

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**4,610,599**

## APPARATUS FOR CONTROLLING A HYDRAULIC TURBINE

**Ray A. Long, Mountville, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Sep. 1, 1983, Ser. No. 528,871**

**Int. Cl.[4] F01D** *17/26;* **F01B** *9/03*

**U.S. Cl. 415—15** **5 Claims**

**1**. An apparatus for controlling a hydraulic turbine having a runner comprising a hub with a plurality of rotatably adjustable runner blades, a single pump supplying pressurized hy-

draulic control fluid, means for rotating said runner blades having a first fluid inlet and a second fluid inlet such that when fluid from said pump is admitted to said first inlet said blades are urged toward a full open position and when fluid is admitted to said second inlet, said blades are urged toward a full closed position, the apparatus comprising:

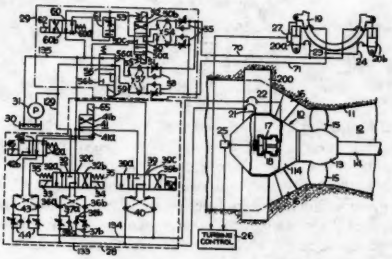
means for sensing the actual position of said blades;

means for comparing said actual position to a predetermined desired position;

primary valve means for admitting fluid from said pump at a constant flow rate to said first inlet when said actual position is closer to a fully closed position than said desired position and for admitting fluid to said second inlet when said actual position is closer to a fully open position than said desired position when said desired position differs from said actual position by more than a predetermined first tolerance; and

secondary valve means for admitting fluid from said pump at a flow rate proportional to the difference between said actual and desired positions to said first inlet when said actual position is closer to a fully closed position than said desired position and for admitting fluid to said second inlet when said actual position is closer to a fully open position than said desired position when said desired position differs from said actual position by less than said predetermined first tolerance;

means for generating a first output signal when said actual position of said blades is closer to said fully closed position



than said desired position and the difference between said actual and desired positions exceeds said first tolerance; a second output signal when said actual position of said blades is closer to said fully open position than said desired position and the difference between said actual and desired positions exceeds said first tolerance; a third output signal proportional to the difference between said actual position and said fully closed position when said difference is less than said predetermined tolerance and indicating whether said actual position is closer to said fully open position than said actual position;

said primary valve means comprising a solenoid valve having a forward state, a reverse state and a neutral state; said solenoid valve being operably connected to said pump to admit a flow of fluid through said solenoid valve to said first inlet when said solenoid valve assumes said forward state and to admit a flow of fluid through said solenoid valve to said second inlet when said solenoid valve assumes said reverse state and to block fluid flow through said solenoid valve when said valve assumes said neutral state; said solenoid valve responsive to said first output signal to assume said forward state and responsive to said second output signal to assume said reverse state; and means for urging said solenoid valve to said neutral state in the absence of a first and second output signal; and

said secondary valve means comprising a servovalve having a forward state, a reverse state and a neutral state; said servovalve operably connected in parallel to said solenoid valve to said pump to admit a flow of fluid through said servovalve in response to said third signal with the flow rate through said servovalve proportional to said signal.

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**4,610,600**

## ADJUSTABLE-PITCH AXIAL FAN WHEEL

**Frank P. Bleier, Chicago, Ill., assignor to Industrial Air, Inc., Amelia, Ohio**

**Filed Jun. 10, 1985, Ser. No. 742,978**
**Int. Cl.[4] F04D *29/36***
**U.S. Cl. 416—207** **4 Claims**

1. A fan having a large hub and adapted for heavy duty industrial use and operating at tip speeds up to 25,000 feet per minute, the pitch of the blades of the fan being adjustable, comprising:

a cast aluminum hub presenting an outer surface which is a portion of a sphere;

a plurality of cast aluminum or other fan blades spaced around said hub;

each said fan blade including an integrally cast airfoil and flange at the inner end of said airfoil, said flange projecting circumferentially well beyond said airfoil blade and having an inner surface which is a portion of a sphere whose diameter is that of the outer surface of said hub;

a generous, integrally cast fillet surrounding the base of said airfoil where it is joined to said flange;

a steel bolt extending radially substantially the entire length of said airfoil blade, said blade being cast around said bolt, said bolt having a threaded portion projecting inwardly from said flange;

said hub having a central hole and two lateral holes for each blade;

said flange of each blade having two arcuate holes aligned with respective lateral holes in said hub;

said threaded portion of said bolt passing through said central hole and being secured to said hub by a nut;

and bolts passing through said aligned holes to secure said flange to said hub;

whereby the pitch angle may be changed by rotating said blade about said bolts within the limits permitted by said arcuate slots.

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**4,610,601**

## METHOD OF MAKING AXIAL FAN IMPELLER

**Sten R. Gerfast, 1802 Valley Curve Rd., Mendota Heights, Minn. 55118**

**Filed Jul. 2, 1984, Ser. No. 627,087**
**Int. Cl.[4] F03D *11/02***
**U.S. Cl. 416—234** **11 Claims**

1. A method of making an axial fan impeller comprising the steps of

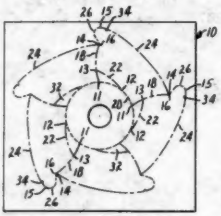
(a) forming in a flat malleable blank

n generally radial cuts extending from first points equally spaced along a central circle, n being an integer of at least 3,

n symmetrical first spiral cuts, each extending outwardly from a second point on said circle between adjacent first

points to a third point on an adjacent generally radial cut, and

n symmetrical second spiral cuts extending from fourth points at the outward extremities of the generally radial cuts, each second spiral cut extending generally parallel to the radially adjacent first spiral cut, an extension of each second spiral cut terminating at the next second spiral cut,



(b) shaping each portion of the blank between radially adjacent first and second spiral cuts to provide n air-driving blades, the peripheries of which along the n second spiral cuts together generally define a cylinder coaxial with said central circle, and

(c) forming each portion of the blank between said central circle and one of said first spiral cuts not to extend radially beyond the circle.

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**4,610,602**

## ROTARY GAS COMPRESSOR

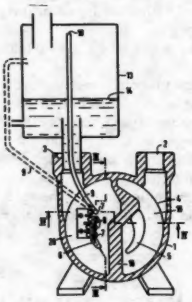
**Norbert Schmid, and Siegfried Schönwald, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany**

**Division of Ser. No. 629,037, Jul. 9, 1984, Pat. No. 4,565,498. This application Jun. 19, 1985, Ser. No. 746,556**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337837**

**Int. Cl.[4] F04C** *19/00*

**U.S. Cl. 417—68** **6 Claims**



1. A rotary liquid ring type gas compressor comprising: an impeller housing; an impeller rotatably mounted in the housing; a housing cover; a control disc arranged between the housing and the cover; a suction intake; an outlet side having a pressure outlet; a suction slot arranged in the control disc to provide communication between the suction intake and the impeller; a pressure slot arranged in the control disc to provide communication between the impeller and the pressure outlet; an additional aperture arranged in the control disc adjacent to the pressure slot; and a pipe for relieving pressure and supplying ballast gas to the compressor communicating at one end with the additional aperture and at its opposite end opens above the liquid level into a liquid separator connected to the compressor on the outlet side.

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**4,610,603**

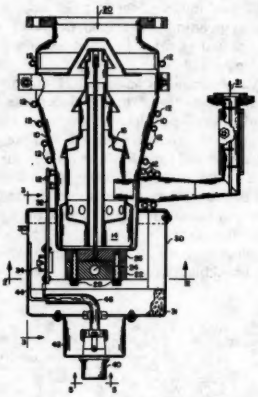
## PROTECTIVE CONTROL SYSTEM FOR DIFFUSION PUMP

**Arthur E. Norman, Northridge, Calif., assignor to Torr Vacuum Products, Inc., Simi Valley, Calif.**

**Filed Jul. 6, 1981, Ser. No. 280,545**

**Int. Cl.[4] F04F** *9/00*

**U.S. Cl. 417—154** **7 Claims**



1. In a diffusion pump, and the like, which includes a containment vessel having a tubular wall, a boiler mounted at the bottom of the containment vessel for vaporizing a working fluid within the vessel, and means for cooling the tubular wall of the containment vessel above the boiler to condense the vapor of the working fluid, the combination of: heater means mounted adjacent to said boiler; a thermally conductive bracket attached at one end to said cooling means and having its other end extending into spaced relationship with said heater means to be heated by conduction from the cooling means and to be heated by radiation from the heater means; electrical circuitry for supplying electric current to the heater means; and a thermally responsive switch mounted on said bracket to de-energize the heater means when the temperature of the bracket at the point of contact with the switch rises above a predetermined level.

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**4,610,604**

## SWASH-PLATE-TYPE COMPRESSOR WITH A MUFFLING ARRANGEMENT

**Hidekazu Iwamori, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan**

**Filed Mar. 20, 1985, Ser. No. 713,995**

**Claims priority, application Japan, Mar. 21, 1984, 59-41130[U]**

**Int. Cl.[4] F04B** *1/16, 1/18, 39/00*

**U.S. Cl. 417—269** **8 Claims**

1. In a multi-cylinder swash-plate-type compressor adapted for use in compressing a refrigerant gas of a cooling circuit, including:

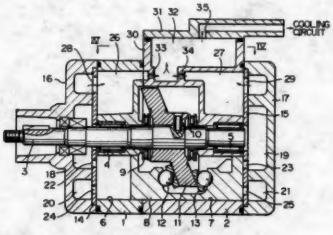
cylinder block means having therein a swash-plate operated reciprocative piston mechanism for sucking, compressing, and discharging a refrigerant gas and delivery passage means for delivering the refrigerant gas after compression,

housing means arranged so as to close axial ends of the cylinder block means and having therein suction and

discharge chambers in communication with the reciprocative piston mechanism, and

connecting flange means mounted on the cylinder block means for sending out the compressed refrigerant gas from the discharge chambers to the cooling circuit via the delivery passage means of the cylinder block means,

the improvement which comprises:



muffling chamber means closed by said connecting flange means for receiving said compressed refrigerant gas delivered from a collision zone means, and

said collision zone means in gas flow communication with said muffling chamber means, for causing a pair of opposed streams of said compressed refrigerant gas to collide before said compressed refrigerant gas enters said muffling chamber means, said collision zone means in flow communication with said delivery passage means.

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**4,610,605**

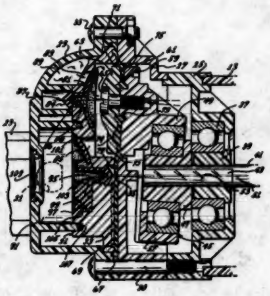
## TRIPLE DISCHARGE PUMP

**E. Dale Hartley, Malibu, Calif., assignor to Product Research and Development, Anaheim, Calif.**

**Filed Jun. 25, 1985, Ser. No. 748,484**

**Int. Cl.[4] F04B** *1/18, 43/00;* **F01B** *19/00*

**U.S. Cl. 417—269** **19 Claims**



1. A pump comprising:

a housing;

a flexible diaphragm mounted in said housing;

means cooperating with a first region of the diaphragm to define a first pumping chamber, said pumping chamber having an inlet and an outlet;

a wobble plate drive at least partially in said housing and subject to nutating motion, said wobble plate drive being drivingly coupled to said first region of the diaphragm to provide a pumping action in said first pumping chamber;

said wobble plate drive having a nutating axis and said first region of the diaphragm lying radially outwardly of the nutating axis;

said first region of said diaphragm having a generally annular ramp section which flexes when driven by the wobble plate drive to provide said pumping action in the first pumping chamber; and

said ramp section when unstressed by any external member being wider radially at a location remote from the nutating axis than at a location nearer the nutating axis.

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**4,610,606**

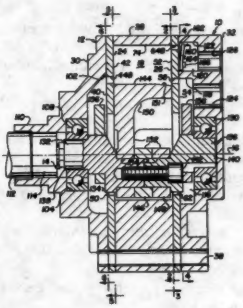
## GAS REFRIGERANT COMPRESSOR INCLUDING PORTED WALLS AND A PISTON OF UNITARY CONSTRUCTION HAVING A DOMED TOP

**Preston C. Hazzard, Watauga, and Chris N. Hazzard, Bedford, both of Tex., assignors to HCH Development, Inc., Dallas, Tex.**

**Filed Aug. 6, 1984, Ser. No. 638,245**

**Int. Cl.[4] F04B** *27/04, 39/10;* **F16J** *1/00*

**U.S. Cl. 417—273** **4 Claims**



1. A gas refrigerant compressor, comprising: a shaft having a first portion and an offset portion; a body supporting the first portion of said shaft for rotating movement around an axis of rotation, said body having a width and defining a compression chamber, the compression chamber of said body having front and back planar walls disposed in facing relationship with one another and planar side walls disposed in facing relationship with one another and a domed top with a cylindrical axis extending between front and back walls, a refrigerant inlet port for carrying vapor to the compression chamber and a refrigerant outlet port for carrying vapor out of the compression chamber; a compression member movably disposed within said body having a head movable within the compression chamber with a length extending along the body width and an arm connected to the offset portion of said shaft permitting rotating movement around said shaft, said compression member having a rectilinear cross section to be complimentarily disposed within the compression chamber and a dome with a cylindrical shape to complimentarily nest within the domed top of the compression chamber, said compression member being of unitary construction and said body and shaft being constructed from at least two parts, said body and said compression member defining a shaft chamber, the inlet ports being disposed through the front and back walls defining the compression chamber such that the gas refrigerant flows through the shaft chamber and around said shaft.

**4,610,607**

## STEERING ASSISTANCE PUMP

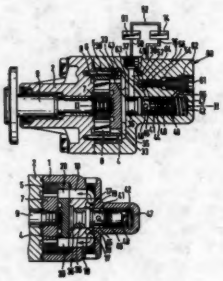
**Heinz Krüger, Usingen; Heinz Teubler, Friedrichsdorf; René Schulz, Neu-Anspach, and Erwin Stäemmler, Kronberg, all of Fed. Rep. of Germany, assignors to Vickers Systems GmbH, Bad Homburg, Fed. Rep. of Germany**

**Filed Feb. 27, 1985, Ser. No. 706,150**

**Claims priority, application European Pat. Off., Mar. 3, 1984, 84 102 295.7**

**Int. Cl.⁴ F04C** *15/02*

**U.S. Cl. 417—292** **14 Claims**



**1.** A pump for creating a fluid flow comprising:

a casing;

inlet duct means to provide a communication of the pump with a tank;

an output line to provide a communication of the pump with a load;

valve means including a flow control valve for dividing said fluid flow of the pump within said pump casing into a controlled output flow and an excess flow;

passage means for carrying said controlled output flow to said output line;

said inlet duct means including an internal inlet passage for carrying an inlet flow of fluid for the pump, disposed internally of said casing;

bypass passage means for carrying said excess flow to said internal inlet passage;

said valve means also including a pressure relief valve having a control chamber connected through a pressure sensing passage to said output line and being subjected to the pressure of said controlled output flow;

said pressure relief valve being operable when a limit pressure in said control chamber is exceeded to relieve a relief fluid flow under pressure through relief passage means and said bypass passage into said inlet passage, said relief fluid flow passing through said pressure sensing passage before entering in said relief valve, said relief passage means and said bypass passage means;

and a temperature sensor valve disposed in said pressure sensing passage and operable to open a flow passage to said inlet duct means when the temperature in said pressure sensing passage exceeds a limit value.

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**4,610,608**

## AIR PUMP CONSTRUCTION

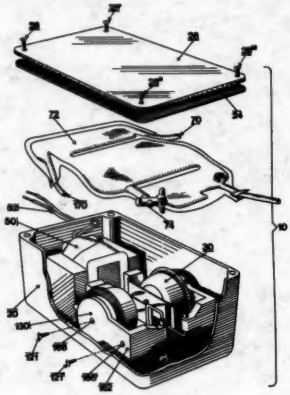
**Benton H. Grant, Stamford, Conn., assignor to Grant Airmass Corporation, Stamford, Conn.**

**Filed Aug. 27, 1982, Ser. No. 412,287**

**Int. Cl.⁴ F04B** *45/04*

**U.S. Cl. 417—413** **13 Claims**

**1.** An electric air pump assembly of the type comprising a housing containing at least one diaphragm pump having a base and a reciprocable diaphragm, an actuator arm affixed to said diaphragm at a location between the two ends of said arm, pivot means for supporting one end of said arm, and electromagnet means operable to reciprocate the unsupported end of said arm and thereby cause said arm to reciprocate about said pivot means and cause said diaphragm to reciprocate in a pumping action, which further comprises: alignment means,



integrally formed in one piece with said diaphragm pump base and said pivot means, for aligning said actuator arm and said diaphragm within said housing, said alignment means being attachable to and removable from said housing independently of said electromagnet means.

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**4,610,609**

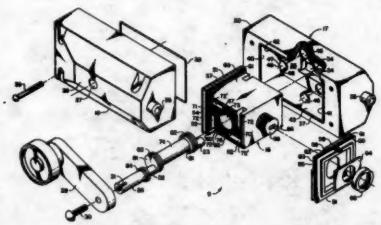
## SEALING APPARATUS FOR DEVICE HAVING VARIABLE VOLUME CHAMBERS

**William W. Milburn, Jr., 945 Ninth St., Boulder, Colo. 80302**

**Filed Jun. 8, 1984, Ser. No. 618,597**

**Int. Cl.⁴ F04B** *29/00;* **F16J** *9/22*

**U.S. Cl. 417—466** **13 Claims**



**1.** In a device having wall means defining a work chamber and first and second work pieces within said chamber to vary the volume of first and second compartments within said chamber with said first and second work pieces being moveable in different directions with respect to one another, apparatus comprising:

first sealing means mounted on one of said first work piece and said wall means and engaging the other of said first work piece and said wall means to provide a seal for said first compartment thereat;

second sealing means mounted on one of said second work piece and said wall means and engaging the other of said second work piece and said wall means to provide a seal for said second compartment thereat, at least one of said first and second sealing means including a plurality of raised portions engaging said other of said work pieces and said wall means; and

nutation guides mounted on one of said wall means and said second work piece and engaging the other of said wall means and said second work piece to constrain travel of said work piece in a predetermined manner, with said second work piece being constrained by said nutation guides to move in a circle of nutation about said nutating guides, and with said second work piece being mounted on a shaft imparting nutating movement to said second work piece.

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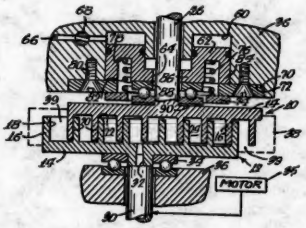
**4,610,610**

## UNLOADING OF SCROLL COMPRESSORS

**Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.**

**Division of Ser. No. 641,214, Aug. 16, 1984, Pat. No. 4,575,318.**
**This application Sep. 25, 1985, Ser. No. 779,976**
**Int. Cl.[4] F04C** *2/04, 15/04, 18/04, 29/10*
**U.S. Cl. 418—14** **3 Claims**




1. A positive displacement compressor or pump of the scroll type comprising:

first and second scroll plates having convoluted, interfitting vanes, the flanks of the vane(s) on one plate being in sealing contact with the flanks of the vane(s) on the other plate at at least two locations, the tips of the vane(s) on each plate being in sealing contact with the other plate whereby at least one sealed pocket exists between said plates;

a generally central port in at least one plate through which fluid may pass;

a peripheral port to the interface of said plates spaced outwardly from said central port;

means for causing said plates to undergo orbital movement relative to each other to cause said pocket(s) to deliver fluid between said ports; and

selectively operable means for causing said plates to move axially away from one another to break at least said sealing contacts between said tips and said plates and form a leakage path from said pocket(s) through the interface between said plates and including a piston and a spring acting in opposition to said piston, one of said piston and spring acting to move said plates axially toward each other and the other of said piston and spring acting to move said plates axially away from each other, and stop means for limiting movement of said plates axially toward each other.

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**4,610,611**

## SCROLL TYPE POSITIVE DISPLACEMENT APPARATUS WITH TENSION RODS SECURED BETWEEN SCROLLS

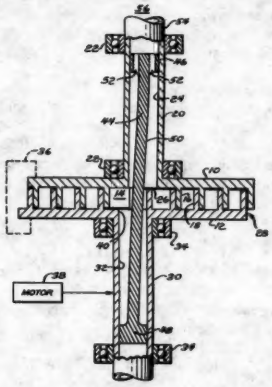
**Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Oct. 15, 1985, Ser. No. 787,319**
**Int. Cl.[4] F01C** *1/04, 21/00;* **F16D** *3/00*
**U.S. Cl. 418—55** **7 Claims**

1. Positive displacement apparatus of the scroll type comprising:

first and second scrolls in side by side relation and each having at least one generally spiral shaped vane;

said vanes interfitting to define at least one closed pocket at their interface which is movable between ports at positions centrally of the scrolls and peripherally thereof;




means mounting said scrolls so that one scroll at least orbits with respect to the other to move said pocket between said ports;

means for orbiting said one scroll; and

a tension rod extending between said scrolls having its opposite ends fixedly secured to respective ones of said scrolls.

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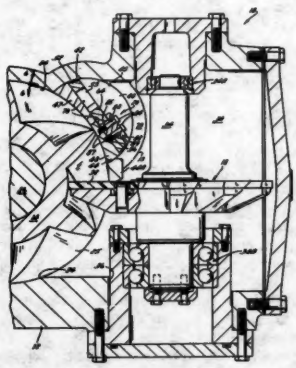
**4,610,612**

## ROTARY SCREW GAS COMPRESSOR HAVING DUAL SLIDE VALVES

**Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.**

**Filed Jun. 3, 1985, Ser. No. 740,816**
**Int. Cl.[4] F04C** *18/20, 18/16*
**U.S. Cl. 418—195** **7 Claims**



1. In a rotary gas compressor, in combination:

a housing comprising a bore;

a helically grooved main rotor having a rotor axis and mounted for rotation in said bore;

other rotor means cooperating with said main rotor to define a plurality of compression chambers extending along said main rotor;

a low pressure suction port and a high pressure discharge port for communicating with said compression chambers;

suction slide valve means slidably movable parallel to said axis of said main rotor between open and closed positions relative to said suction port to thereby function as a suction by-pass to control compressor capacity; and

discharge slide valve means slidably movable parallel to said axis of said main rotor between open and closed positions relative to said discharge port to thereby control compressor volume ratio and thereby power input to the compressor;

said suction slide vlave means and said discharge slide valve means being independently movable, said suction slide valve means comprises a member having a portion proximate to and cooperable with said suction port and said discharge slide valve means comprises a member having a portion proximate to and cooperable with said discharge port.

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**4,610,613**

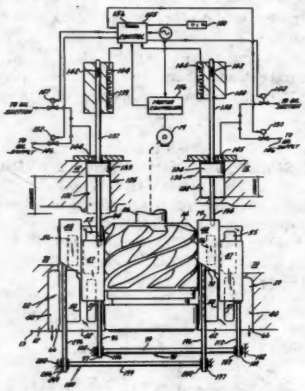
## CONTROL MEANS FOR GAS COMPRESSOR HAVING DUAL SLIDE VALVES

**Paul G. Szymaszek, Waukesha, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.**

**Filed Jun. 3, 1985, Ser. No. 740,817**

**Int. Cl.[4] F04C** *18/16, 18/20*

**U.S. Cl. 418—195** **7 Claims**



1. A rotary screw gas compressor for a refrigeration system comprising:

a compressor housing comprising end walls at opposite ends thereof and a rotor bore therein;

a motor-driven main rotor having helical grooves and mounted for rotation in said rotor bore;

a pair of star-shaped gate rotors rotatably mounted in said housing and engageable with said helical grooves in said main rotor to define a plurality of gas compression chambers;

suction port means and discharge port means in said compressor housing;

a pair of recesses in said housing disposed on opposite sides of said main rotor and communicating with said rotor bore;

a pair of suction slide valve members and a pair of discharge slide valve members, with one suction slide valve member and one discharge slide valve member being located in one of said recesses on one side of said main rotor and the other suction slide valve member and the other discharge slide valve member being located in the other of said recesses on another side of said main rotor;

a first linkage mounted on the exterior of one end wall of said housing for interconnecting the two suction slide valve members to enable them to move in unison;

a second linkage mounted on the exterior of said one end wall of said housing for interconnecting the two discharge slide valve members to enable them to move in unison;

each linkage comprising a pair of rods extending through said one end wall and connected to respective slide valves whereby movement of one slide valve in a pair effects movement of the corresponding slide valve in the other pair;

both slide valve members in each of said recesses being disposed in side-by-side sliding relationship in their respective recess, and each slide valve member having a face which is complementary to and confronts said main rotor surface in sliding sealed relationship;

said suction slide valve members being slidably positionable between full-load and unload positions to control where low pressure uncompressed refrigerant gas from said suction port means is admitted to said compression chambers to thereby function as a suction bypass to control compressor capacity;

said discharge slide valve members being slidably positionable between minimum and adjusted volume ratio positions to control where high pressure compressed refrigerant gas is expelled from said compression chambers to said discharge port means to thereby control the input power to the compressor;

a first actuator assembly on said housing for moving said pair of suction slide valves in unison with each other; a second actuator assembly on said housing for moving said pair of discharge slide valves in unison with each other;

each actuator assembly comprising:

an actuator mounted on said housing and including a movable actuator member;

a first rod extending inwardly from the other end wall of said compressor housing for mechanically connecting said movable actuator member to one slide valve in one of a pair of slide valves;

a second rod extending outwardly from said other end wall and connected to said movable actuator member;

and control means responsive to compressor capacity and volume ratio to position said slide valve members to cause the compressor to operate at a predetermined capacity and minimum power input, said control means including a pair of sensing devices mounted on said housing to detect the position of said slide valve members and to effect operation of said actuators, each of said sensing devices being connected to said second rod of said respective actuator member to thereby detect the position of its associated pair of slide valve members.

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**4,610,614**

## VANE PUMP

**Kyosuke Haga, Anjo; Tsuneo Tanaka, and Toshifumi Sakai, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Jan. 30, 1985, Ser. No. 696,514**

**Claims priority, application Japan, Feb. 1, 1984, 59-17933; Feb. 3, 1984, 59-18573**

**Int. Cl.[4] F04C** *18/00*

**U.S. Cl. 418—269** **3 Claims**

1. A vane pump for pumping fluid, comprising:

a pump housing

a cam ring received in said pump housing and formed with an internal cam surface therein;

a rotor disposed within said cam ring and having a plurality of vane support slits formed equiangularly therein;

a drive shaft rotatably disposed within said pump housing for rotating said rotor;

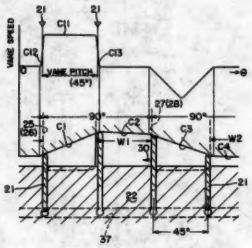
a plurality of vanes respectively disposed within said vane support slits of said rotor, said vanes being radially extensible from said rotor for moving along said internal cam surface when said rotor is rotated;

at least one side plate received in said pump housing in contact engagement with one end surface of said cam ring;

a pair of intake ports formed on said at least one side plate for leading fluid into a pump chamber defined by said internal cam surface of said cam ring, said rotor and said at least one side plate;

a pair of exhaust ports formed on said at least one side plate for discharging fluid pressurized in said pump chamber;

a lead formed on said at least one side plate and extending circumferentially from the start point of each of said exhaust ports toward one of said intake ports for gradually introducing high pressure fluid in each of said exhaust ports into a pump sector which any consecutive two of said vanes isolated from said intake and exhaust ports when moving between one of said intake ports and one of said exhaust ports; and




an annular vane back pressure groove formed on said at least one side plate and communicating with said exhaust ports for applying pressurized fluid to all of said vane support slits; wherein:

said cam ring is formed at said internal cam surface with a pair of diametrically opposed intake curve sections, each of which is composed of a constant velocity curve portion and acceleration and deceleration curve portions respectively provided at front and rear sides of said constant velocity curve portion; and wherein

the angular width between starting points of said acceleration and deceleration curve portions and the angular width between the end points of said acceleration and deceleration curve portions are equal to the pitch of said vanes.

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**4,610,615**

## APPARATUS FOR THE PRODUCTION OF GRANULES

**Reinhard Froeschke, Weinstadt, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland**

**Filed May 14, 1985, Ser. No. 733,746**

**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421625**

**Int. Cl.[4] B28B *1/54***

**U.S. Cl. 425—8** **17 Claims**

1. Apparatus for the production of granules from a flowable medium comprising:

a cylindrical vessel rotatable about a horizontal axis, said vessel including a plurality of orifices distributed circumferentially around said vessel through which the medium can flow from inside the vessel,

a collector wall disposed stationarily within said vessel and extending obiquely relative to a horizontal plane containing said axis, so as to include upper and lower ends, said lower end being spaced above an internal surface of said vessel,

means for introducing a flowable medium into said vessel such that the introduced flowable medium falls downwardly onto said collector wall and flows downwardly thereupon and over said lower end and onto said internal surface of said vessel,

a baffle surface disposed in said vessel extending downwardly and pressing against a bottom region of said internal surface of said vessel and positioned so that the flowable medium flowing over said lower end and onto said internal surface is situated ahead of said baffle surface with reference to the rotation of said vessel so that said baffle surface exerts pressure against the medium to promote the flow of medium through said orifices,

said vessel being rotatable relative to said collector wall and baffle, and

cooling means disposed beneath said vessel and movable relative thereto and arranged to receive the medium falling from said orifices,

said upper end of said collector wall extending to a location closely adjacent said internal surface of said vessel, and said collector wall arranged to overlie a space in said vessel located behind said baffle surface such that residual medium gravitating from said orifices above said space can fall onto said collector wall and travel downwardly therealong to said lower end,

said apparatus further comprising a stationary heating means disposed within said vessel for heating said collector wall.

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**4,610,616**

## BRICK MOULDING DEVICE

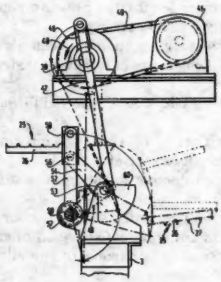
**Wilhelmus J. M. Kosman, Groesbeek, Netherlands, assignor to 501 Machinefabriek de Boer B.V., Nijmegen, Netherlands**

**Filed Nov. 8, 1983, Ser. No. 550,037**

**Claims priority, application Netherlands, Nov. 25, 1982, 8204597**

**Int. Cl.[4] B29C *39/24***

**U.S. Cl. 425—99** **12 Claims**



1. A device for receiving a mass of clay which is to be formed into a brick and for depositing it accurately in a molding tray, which comprises:

a carrier having a supporting surface;

first and second pivot means connected to said carrier in spaced relation to each other;

linkage means for sweeping said first and second pivot means synchronously back and forth along respective first and second arcuate paths and a drive means for oscillating said linkage means so that said first pivot means sweeps

said first arcuate path from a first end position at one end of said first arcuate path to a second end position at the other end of said first arcuate path while being decelerated as it approaches said second end position and said second pivot means sweeps said second arcuate path from a first end position at one end of said second arcuate path to a second end position at the other end of said second arcuate path while also being decelerated as it approaches said second end position thereof;

the radii of said first and second paths being such that said supporting surface moves from an upwardly facing position when said first pivot means and said second pivot means are at said first end positions thereof to a downwardly facing position in registry above a molding tray when said first pivot means and said second pivot means are at the second end positions thereof so that as said supporting surface approaches said downwardly facing position in registery above a molding ray, the decelerations of said first and second pivot means separate the mass of clay from said supporting surface and deposit it accurately into the molding tray.

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**4,610,617**

## HEAT INSULATING PROTECTIVE SHIELDS FOR TWO-ROLL CALENDER WITH HEATED ROLLS

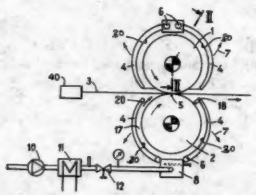
**Alfred Christ, Zurich, and Rolf Lehmann, Rudolfstetten, both of Switzerland, assignors to Sulzer-Escher Wyss AG, Zurich, Switzerland**

**Filed Jan. 30, 1984, Ser. No. 575,009**

**Claims priority, application Switzerland, Feb. 10, 1983, 749-83**

**Int. Cl.[4] B29C *43/24***

**U.S. Cl. 425—143** **9 Claims**



1. A two-roll calender for the pressure and thermal treatment of material webs, comprising:

two heated rolls forming therebetween a contact pressure gap through which passes a web of material undergoing processing;

means for feeding said web of material through said contact pressure gap;

each of said two heated rolls having a circumferential region and oppositely located end regions;

heat insulating protective shields provided for each of said two heated rolls;

means for pivotally mounted said heat insulating protective shields at said circumferential region of each of said two heated rolls so as to be capable of laterally pivoting away therefrom;

heat insulating protective end covers mounted at said end regions of each of said two heated rolls;

cooling means provided for at least one of said two heated rolls;

said cooling means comprising a blower device capable of being supplied with air at a predetermined temperature to produce an air current which can be locally regulated over the longitudinal extent of said one roll; and

said cooling means acting in a gap formed between said one roll and a related one of said heat insulating protective shields to produce a cooling effect on said one roll for substantially regulatably producing a predetermined temperature profile over said longitudinal extent of said one roll.

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**4,610,618**

## HYDRAULIC PRESS

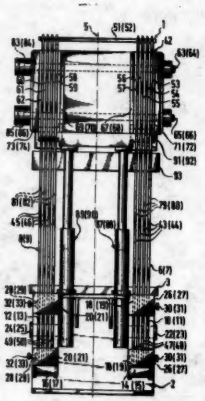
**Klaus Schmidts; Dieter Therolf, and Ulrich Weber, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Aug. 28, 1985, Ser. No. 770,636**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432286**

**Int. Cl.[4] B29C *17/00, 3/00;* B29F *1/00;* B30B *11/00***

**U.S. Cl. 425—383** **4 Claims**



1. An hydraulic press, usable as a forming press for composite sheet material, with a press base, several vertical guides extending from the press base and a cross head slidably arranged on the vertical guides, which cross head is hydraulically clampable to the vertical guides, with a slidable press plate and a press drive, wherein several long stroke hydraulic cylinders are used to produce the adjustment of the cross head and several short stroke hydraulic cylinders create the stroke of the press plate, characterized in that the vertical guides are each made of several vertically extending laminations spaced from one another by spacing means in the press base, in that the cross head includes several other laminations extending into the spaces between said vertically extending laminations, and by means for releasably clamping said vertically extending laminations and said other laminations to one another to releasably clamp the cross head to the vertical guides.

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**4,610,619**

## PILE FABRIC MOLDING APPARATUS

**Bascum G. Lesley, Pickens, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.**

**Division of Ser. No. 605,147, Apr. 30, 1984, Pat. No. 4,581,193. This application Sep. 30, 1985, Ser. No. 782,039**

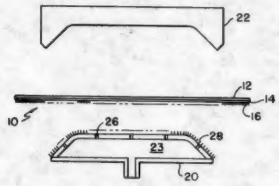
**Int. Cl.[4] B29C *43/02, 51/10, 51/36***

**U.S. Cl. 425—388** **1 Claim**

1. A mold for a pile fabric comprising: a female member and a male member having a shape conforming to the shape of the female member, one of said members having as plurality of pins on the surface thereof which faces the other of said members to allow the fibers of a pile fabric located therebetween to pass between the pin members as the male and female members are brought together

the member with pins thereon having a cavity therein, a conduit in communication with said cavity and plurality of openings in the surface on which said pins are located

and communicating with said cavity so that when a suction pressure is exerted in said cavity through said conduit




a pile fabric placed between said members will be sucked downwardly into said pins.

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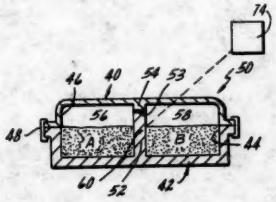
**4,610,620**

## APPARATUS FOR MOLDING PLURAL COLORED PLASTIC HOLLOW SHELLS

**John D. Gray, Durham, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.**

**Filed Sep. 20, 1984, Ser. No. 652,379**
**Int. Cl.[4] B29C *41/04, 41/22***
**U.S. Cl. 425—434** **2 Claims**




1. Apparatus for molding a thin-walled plastic shell in a heated open-ended mold from a charge of thermoplastic powder material in open-ended charge box means comprising: means for joining a mold and charge box means in open-ended relationship; co-acting means on the box means and the mold to define at least two separate molding surfaces on the mold; means for rotating the mold and charge box means so as to distribute separate charges of powder material against the separate molding surfaces of the mold, connector formation means including a style line molding surface on the mold separate from and raised with respect to said at least two separate molding surfaces, means including a divider on the charge box means and seal gasket means on said divider with a surface area complementary to said styling line molding surface and selectively engageable therewith to completely shield the styling line molding surface as material is distributed on the other casting surfaces; means for selectively separating said seal gasket means from said styling line molding surface to completely expose it, and means for distributing thermoplastic powder on the completely exposed style line molding material between the material previously molded on the separate molding surfaces to form a connector style line bonded therebetween.

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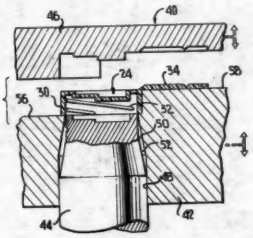
**4,610,621**

## MOLD FOR CLOSURE CAP

**James M. Taber, and Stephen J. Kras, both of Chicago, Ill., assignors to Continental White Cap, Inc., Northbrook, Ill.**

**Filed Nov. 28, 1984, Ser. No. 675,798**
**Int. Cl.[4] B29C *33/44;* B29D *1/00***
**U.S. Cl. 425—577** **7 Claims**

1. A mold for forming by injection molding a closure cap including an end panel and a cylindrical body, said cylindrical body having a free end and an integral interrupted internal thread about a major portion of said body; said mold comprising a core for defining internal surfaces of the closure cap and including thread forming means for forming said integral thread, said core having an end and a circumferential portion free of thread forming means defining an interruption of the thread forming means, opposing first and second mold members having an irregular parting line, said first mold member having received therein said core for relative movement axially of said core, said core projecting above a portion of said parting line with said first mold member along said parting line portion defining said free end of the closure cap body, said first mold member also having one wall portion opposing that circumferential portion of said core free of thread forming




means defining said interruption of the thread forming means aand further defining a part of an exterior wall of the closure cap body, and said second mold member having a wall opposing said core and forming the remainder of the exterior wall of the closure cap body and a wall opposing said core end to form the end panel of the closure cap; said first and second mold members being separable along said parting line to separate said second mold member from a molded cap to free that portion of a molded closure cap having an internal thread, and said first mold member thereafter being movable relative to said core to strip the molded closure cap from said core with the separation of the molded cap from the first mold member being automatic.

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**4,610,622**

## METHOD AND APPARATUS FOR IGNITING FLARE GAS

**John O. Quinnell, Box 4095, Skaar Rte., Sidney, Mont. 59270**

**Filed Oct. 10, 1984, Ser. No. 659,488**
**Int. Cl.[4] F23D *14/00***
**U.S. Cl. 431—5** **25 Claims**

1. An apparatus for igniting hydrocarbon gases, said apparatus comprising:

an upwardly extending, elongated conduit defining an interior chamber, said conduit having upper and lower portions and said upper portion having an open end;

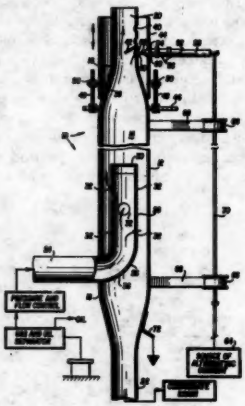
an inlet conduit for such gases extending into said chamber, the cross-sectional area of said inlet conduit being substantially smaller than that of said chamber;

means, located within said chamber and connected to said inlet conduit to receive the flow of such gases, for causing vapors entrained in said gases to form condensate which moves downwardly in said chamber and for releasing said gases into said chamber for expansion therein;

means for withdrawing from said chamber a portion of said gases as said flow moves upwardly toward said open end;

means for receiving said portion of said gases and directing said portion upwardly toward said open end; and means for igniting said portion of said gases, whereby a pilot flame is established to ignite the remainder of said gases flowing through said open end and wherein said means for causing and releasing comprises an upwardly projecting extension of said inlet conduit within said chamber, said

extension being closed at its upper end and having a plurality of laterally opening discharge apertures through



which said gases are released toward the interior walls of said chamber.

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**4,610,623**

**GAS BURNER**

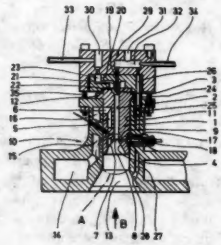
**Heinrich Lambrecht, Neuenstadt, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany**

**Filed Feb. 25, 1985, Ser. No. 705,065**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407882**

**Int. Cl.[4] F23D *11/44***

**U.S. Cl. 431—243** **9 Claims**



**1**. Gas burner with a feeder for a burnable gas mixture and an ignition device for igniting the burnable gas mixture comprising a generally cylindrical burner with a central longitudinal bore forming a mixer canal having an inlet and an outlet with the outlet having a conically enlarging recess (**4**) that joins the outlet with a junction (**8**), the junction (**8**) being surrounded by a number of intake openings (**7**) for a gas to be heated which openings lead to feeder canals (**5**), with the gas to be heated through the walls of the conical recess (**4**) parallel to the symmetry axis of the mixer canal (**2**) and the conical recess (**4**), and in an area between the junction (**8**) and the intake openings (**7**) there is a lateral canal (**9**) which brances off from the recess (**4**) and leads to the ignition device (**18**).

**4,610,624**

**HAND-OPERATED GAS LIGHTER**

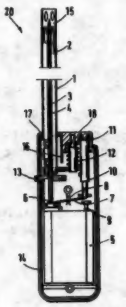
**Hans-Peter Bruhn, Abteistrasse 41, D-2000 Hamburg 13, Fed. Rep. of Germany**

**Filed May 16, 1985, Ser. No. 734,533**

**Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 8436764**

**Int. Cl.[4] F23Q *7/12***

**U.S. Cl. 431—255** **4 Claims**



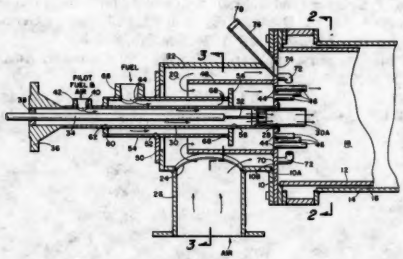
**1**. A pistol-like hand-operated gas lighter for igniting and making burn cookers, grills and open fires and the like with a liquid fuel comprising an elongated casing, an extended fuel supply/ignition tube secured to the casing in the manner of a barrel on a pistol, an electrically actuated igniter/burner secured to the free end of the fuel supply/ignition tube, a liquid gas tank contained within the elongated casing and having a gas tube leading from the liquid gas tank through the fuel supply/ignition tube to the igniter/burner, on-off valve means positioned on the gas tank in the elongated casing, piezoelectric generator means positioned in the elongated casing adjacent the on-off valve means, lever means mechanically interconnecting said on-off valve means and said piezoelectric generator means whereby upon acutation of the piezoelectric generator means, the on-off valve means is opened and allows fuel to flow through the gas tube to the igniter/burner, an electrical conductor extending from the igniter/burner through the extended fuel supply/ignition tube to within the elongated casing, means within the elongated casing for electrically connecting the output electric potential from the piezoelectric generator means to the said electrical conductor upon the piezoelectric generator means being actuated to thereby produce an electric arc in the igniter/burner, starting means comprising a spring-loaded trigger-like pusher element arranged on the end of the elongated casing immediately below the extended fuel supply/ignition tube in the manner of a trigger, said trigger-like pusher element being physically secured to and serving to actuate the piezoelectric generator means upon being depressed in the manner of a trigger, and wheel actuated regulator valve means supported on said elongated casing for regulating the flow rate of fuel through the gas tube, said wheel of said regulator valve means extending through a side of said elongated casing on the same end thereof and at a point close to but set back somewhat with respect to the trigger-like pusher element whereby an operator can simultaneously actuate and regulate the gas lighter by pulling the trigger-like pusher element with the index finger and rotating the wheel-actuated regulator valve means with the thumb of the same hand.

4,610,625

## BURNER

Richard L. Bunn, 7854 E. 79th, Tulsa, Okla. 74133

Filed Sep. 23, 1985, Ser. No. 757,673
Int. Cl.[4] F23Q *9/00*
U.S. Cl. 431—284 3 Claims



1. A gas burner comprising:
an elongated combustion chamber defined in part by the forward surface of a fire wall;
an ignition means extending through an opening in said fire wall and having one end thereof centrally positioned within said combustion chamber;
said ignition means including a pilot tube and a conductive member received within said pilot tube providing means for generating ignition sparks within said pilot tube adjacent the end thereof within said combustion chamber;
a plurality of jet openings in said fire wall in spaced relationship around and spaced from said pilot tube;
a jet member received within each said jet opening and extending into said combustion chamber;
a mixing chamber defined in part by the rearward surface of said fire wall, the mixing chamber having separate fuel and air inlets;
a tubular partition received within said mixing chamber, one end of the tubular partition being secured to said fire wall rearward surface said pilot tube being received concentrically within said tubular partition and said jet openings communicating with the interior of the tubular partition;
said fire wall having a plurality of spaced apart secondary air openings therein communicating with said mixing chamber exteriorally of said tubular partition; and
a secondary air jet secured to said fire wall within said combustion chamber in communication with said secondary air openings, each said secondary air jet including means to discharge air into said combustion chamber in directions tangent to the longitudinal axis of said combustion chamber.

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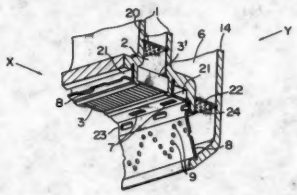
4,610,626

## HIGH LOAD GAS COMBUSTION APPARATUS

Fumitaka Kikutani, Nara; Koro Furumai, Ikoma; Masahiro Indou, Tenri, and Kazuo Fujishita, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 20, 1984, Ser. No. 622,744
Claims priority, application Japan, Jun. 23, 1983, 58-113725; Jul. 20, 1983, 58-113286[U]; Sep. 14, 1983, 58-169635
Int. Cl.[4] F23D *15/00*
U.S. Cl. 431—351 16 Claims

1. A high load gas combustion apparatus comprising:
a fan for supplying primary and secondary air;
a nozzle having an upstream end connected to a source of fuel;
a mixing tube section for receiving the primary air supplied by said fan and fuel supplied from said nozzle, said primary air and fuel being mixed at the downstream end of said nozzle;
a mixture chamber having an upstream side connected to said mixing tube section;
a flame port section including a plurality of flame ports provided at the downstream side of said mixture chamber;
a combustion chamber provided at the downstream side of said flame port section, said mixture of primary air and fuel being jetted into said combustion chamber through said flame ports; and



a pair of air jet plates provided on opposite sides of said flame port section and extending in the lengthwise direction thereof, each of said air jet plates having a plurality of air ports therein extending in said lengthwise direction in a wave-like configuration, secondary air supplied by said fan being jetted into said combustion chamber through said air ports and across the flow of the mixture jetted into said combustion chamber through said flame ports, whereby a continuous flame zone having a wave-like form is generated in said combustion chamber.

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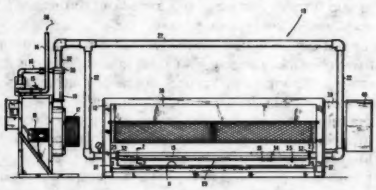
4,610,627

## HIGH VELOCITY, EVEN FLOW FLAME TREATMENT OF WEBS

Walter G. Wise, 226 North Traub, Indianapolis, Ind. 46222

Filed Dec. 4, 1984, Ser. No. 677,861
Int. Cl.[4] F27B *9/28;* C21D *9/54;* F23D *14/62*
U.S. Cl. 432—8 17 Claims

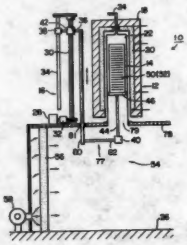


13. A method of flame treating a material web facilitating adherence to said web comprising the steps of:
providing an elongated tube with length and ports along said length;
premixing sufficient air with gas to insure virtual complete combustion of the gas;
forcing a gas/air mixture through said ports at a minimum high velocity;
igniting said mixture to produce a flame along said length;
directing said flame toward and adjacent said material web to directly treat said web with said flame while said web moves across said flame; and
moving said web past said flame at a web velocity equal to or greater than said minimum high velocity of said mixture controlling the position of said flame to treat substantially all flame facing surface of said web while minimizing flame/web dwell.

## 4,610,628
## VERTICAL FURNACE FOR HEAT-TREATING SEMICONDUCTOR

Youichi Mizushina, Kawasaki, Japan, assignor to Denkoh Co., Ltd., Oume, Japan

Filed Dec. 26, 1984, Ser. No. 686,231
Claims priority, application Japan, Dec. 28, 1983, 58-201329[U]; Nov. 6, 1984, 59-232397
Int. Cl.[4] F27D 5/00; F27B 9/00
U.S. Cl. 432—241 3 Claims



1. A vertical furnace for heat-treating a semiconductor comprising:

a furnace section formed into a cylindrical shape and substantially vertically arranged, said furnace section being closed at the upper end thereof and open at the lower end thereof and having a heater means disposed on the inner wall thereof;

a boat means adapted to support a semiconductor thereon so as to allow said semiconductor to be subjected to heat-treating in said furnace section;

a boat supporting means for supporting said boat means thereon;

a connecting means connected to said boat supporting means;

a boat driving means for vertically moving said boat supporting means via said connecting means to permit the introduction and removal of said boat means with respect to said furnace section to be carried out through the lower open end of said furnace body;

an operation space defined below said furnace section so as to allow the charging and discharge operations of said semiconductor with respect to said boat means to be carried out in said operation space; and

a separating means arranged below said furnace section and formed with an opening positionally corresponding to the lower open end of said furnace section, said separating means being adapted to separate a space around said furnace section from said operation space;

said boat driving means being arranged at the outside of said operation space through said separating means;

said connecting means being movably inserted through said separating means;

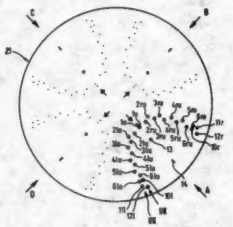
said connecting means comprising a vertically moving shaft vertically arranged to be laterally spaced from said furnace section and vertically movably extend through said separating means and a supporting member fixedly connected to the lower end of said vertically moving shaft to support said boat supporting means; and

said boat driving means comprising a driving motor arranged on said separating means; a driving shaft formed with threads on the overall outer surface thereof which is vertically mounted on said separating means and adapted to be driven by said driving motor; a guide rod arranged in parallel with said driving shaft; a horizontal arm vertically movably engaged at one end thereof with said guide rod, threadedly engaged at the intermediate portion thereof with said driving shaft and connected at the other end thereof to the upper end of said vertically moving shaft.

## 4,610,629
## APPARATUS FOR DETERMINING THE DESIRED POSITION OF TEETH

Hans T. Schrems, and Gabriele Schrems-Adam, both of Dechbettener Strasse 1, D-8400 Regensburg 1, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 639,968
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329084
Int. Cl.[4] A61C 19/04
U.S. Cl. 433—72 10 Claims

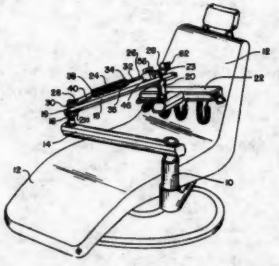


3. Apparatus for determining the desired position of the teeth of a patient, comprising a set of substantially planar templates, each template having markings which correspond to desired positions of the proximal contact points of the teeth in projection on the horizontal plane, the individual templates differing from each other by having their markings located to correspond to different tooth arch lengths and different tooth arch forms, the templates of the set together covering substantially all jaw and tooth arch forms and jaw and tooth arch sizes, which occur in patients, in which said markings on said template each mark the location of a point on said template, said markings being spaced and defining in centrically superposed relation a mandibulary arch and a maxillary arch.

## 4,610,630
## DENTAL INSTRUMENT STAND

Frank A. Betush, Carson, Calif., assignor to Progressive Machine Products, Inc., Carson, Calif.

Filed Jul. 17, 1985, Ser. No. 755,841
Int. Cl.[4] A61G 1/14
U.S. Cl. 433—79 8 Claims



1. An assembly for supporting a unit at selected vertical positions, said assembly comprising: a first post; a second post spaced from said first post; an arm pivotally coupled at one end to said first post and pivotally coupled at its other end to said second post to be angularly movable in a vertical plane about

a pivot axis extending radially through said first post; a rod pivotally coupled at one end to said first post and pivotally coupled at its other end to said second post, said rod extending in spaced and parallel relationship with respect to said arm; a coil spring mounted coaxially on said rod to counter-balance the weight of the supported unit when said arm is moved angularly about said first-named pivot axis, said first post having at least one cam surface formed thereon; and a cam follower member engaging one end of said spring and movable on said cam surface as said second arm is moved angularly about said first-named pivot axis to cause compressive forces to be exerted on said spring as said arm is turned up and down, so that said spring may perform a counter-balancing effect.

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**4,610,631**

## PROCESS FOR THE PRODUCTION OF FILLINGS FOR TEETH

**Hans-Hermann Beyer, Kahl; Walter Diehl, Hanau; Karlheinz Eckert, Gründau; Kurt Eiermann, Pfungstadt, and Hans-Martin Ringelstein, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Jan. 28, 1985, Ser. No. 695,815**

**Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403777**

**Int. Cl.[4] A61K** *5/01*

**U.S. Cl. 433—228.1** **8 Claims**

1. In a process for the production of a filling in a tooth by inserting a powder into the cavity and subsequently mechanically hardening same, the improvement comprising employing a powder comprising a ductile, mouth resistant metal, metal alloy or a cold weldable mouth resistance synthetic resin which has been worked into a paste with a water or saliva soluble plastic organic binder that liquifies at 20° to 45° C. and carrying out the mechanical hardening by ultrasonic action.

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**4,610,632**

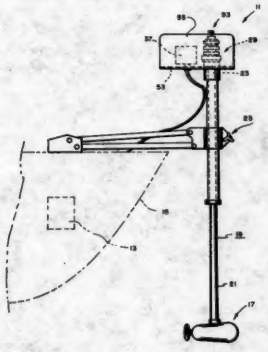
## ELECTRIC BOAT MOTOR

**Edward W. Osborne, P.O. Box 134, Walls, Miss. 38680**

**Filed May 14, 1984, Ser. No. 610,123**

**Int. Cl.[4] B60C** *11/02*

**U.S. Cl. 440—6** **16 Claims**



1. A continuously steerable electric boat motor assembly comprising:

boat mounting means adapted for securement to a boat;

a shaft rotatably coupled to said boat mounting means and extending therebelow;

an electric drive motor means secured to the lower portion of said shaft;

an electric steering motor means fixedly secured with respect to said boat mounting means and coupled to rotatably drive the upper portion of said shaft continuously with respect thereto;

first electric control means electrically connected to selectively provide electrical driving energy to said electric steering motor means to cause continuous clockwise or counter clockwise rotation of said shaft whenever such steering movement is desired;

electrical slip ring and brush means associated with an upper portion of said shaft for continuous rotational coupling of electrical drive energy to said electric drive motor means at the lower portion of said shaft; and

second electrical control means electrically connected with a portion of the electrical slip ring and brush means that is fixed relative to said boat mounting means to selectively provide electrical driving energy to said electric drive motor means whenever boat driving forces are desired.

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**4,610,633**

## KAYAK PADDLE

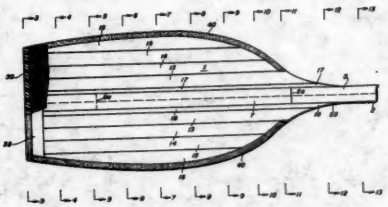
**Kenton L. Freudenberg, 1619 Forest Ave., Durango, Colo. 81301**

**Continuation of Ser. No. 388,182, Jun. 18, 1982, abandoned.**

**This application Apr. 15, 1985, Ser. No. 723,002**

**Int. Cl.[4] B63H** *16/04*

**U.S. Cl. 440—101** **31 Claims**



1. A paddle blade of thin wood construction having a peripheral edge which is subject to abrasive wear and breakage if poked or rubbed against hard abrasive bodies during normal use or handling, said blade having bonded thereto along an an edge portion of the blade as an extension thereof a protective resilient rubber strip means of a thickness essentially the same thickness as the adjacent blade portion, said strip means having a portion of resilient rubber material extending in the direction away from the blade with a thickness:of said resilient rubber material in said direction of at least half the thickness of the adjacent balde portion, the entire surface of said rubber material facing toward the adjacent edge portion of the blade being bonded to said edge portion, said rubber material having greater abrasion resistance than the blade itself to provide a protective shock absorbing and abrasion resistant edge to the blade.

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**4,610,634**

## CORD FOR RETAINING A SURFBOARD

**Gen Kimura, 1-18-5, Higashi Nippora, Arakawa-ku, Tokyo, Japan**

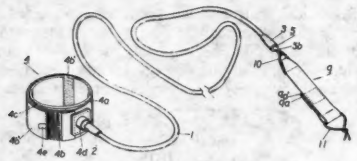
**Filed Mar. 1, 1985, Ser. No. 706,941**

**Int. Cl.[4] A63C** *15/06*

**U.S. Cl. 441—75** **2 Claims**

1. In a cord assembly for retaining a surfboard comprising a wide ankle strap band which is wrapped around the ankle of a rider in a freely attachable/detachable manner and a cord of which one end is connected to said band while the other end is connected to the surfboard via a cushion strip, the improvement wherein the cord is connected to the band by an attachment member made of synthetic resin having a flange plate secured on the periphery of the ankle strap band and a head portion projecting outwardly from the flange plate, one of a pair of metal connecting members forming a swivel joint is embedded and fixed in the head portion of the attachment

member while the other connecting member is embedded and fixed in an enlarged synthetic resin attachment provided at one end of the retaining cord, characterized in that said cushion strip is shaped like a band, connected to the cord, attached with face-to-face fasteners at an open end and center thereof respectively, the open end is passed through a loop-like string connected to the surfboard and then folded back to the center so as to engage the surfboard in a freely attachable/detachable manner using the face-to-face fasteners said ankle strap band



comprises a band-shaped cushion material and a synthetic knit band on the outside thereof over which a face-to-face fastener is sewed while an extended face-to-face fastener is provided to one end of said band so as to make said fabric band wearable around the ankle in a freely attachable/detachable manner, and that a bag-shaped pocket with an opening adjacent to the attachment member is provided between said fabric band and the face-to-face fastener thereof the opening being covered by the tongue of the fastener in a freely openable manner.

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**4,610,635**

## ARRANGEMENT FOR PICKING UP OBJECTS OR OIL FROM THE SEA

**Wilhelm M. Austevoll, N-5395, Steinsland, Norway**

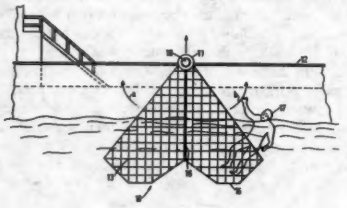
**PCT No. PCT/NO84/00008, § 371 Date Sep. 28, 1984, § 102(e) Date Sep. 28, 1984, PCT Pub. No. WO84/03076, PCT Pub. Date Aug. 16, 1984**

**PCT Filed Feb. 2, 1984, Ser. No. 662,426**

**Claims priority, application Norway, Feb. 2, 1983, 830344**

**Int. Cl.[4] B63C *9/00***

**U.S. Cl. 441—80** **1 Claim**



1. In combination with a vessel having a deck structure and a longitudinally extending generally vertical sidewall between the deck structure and the vessel's water line, apparatus for retrieving objects from the sea alongside the vessel and comprising in combination:

A. boom structure including an elongated support boom and a carrier member rotatably mounted on said support boom for rotation on the longitudinal axis of said support boom, said carrier member including a hollow outer tube provided co-axially on the free end portion of said boom,

B. means on the vessel's deck structure for movably supporting one end of said elongated support boom, said means including a turntable having a fixed portion adapted for attachment to said deck structure and a movable base portion, rotatable on a vertical axis relative said turntable fixed portion, fluid motor means with a first part attached to said base portion and a second part attached to said boom adjacent said one movably supported end for swinging a free end portion of said boom,

C. container means having a generaly planar rear wall, said rear wall having an upper edge supported by said carrier said container mans also having side and bottom walls defining a receptacle arranged forwardly of said rear wall, and

D. said container means being rotatable with said carrier on said support boom such that the receptacle is swung upwardly as said carrier is so rotated at least with said support boom in its work position.

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**4,610,636**

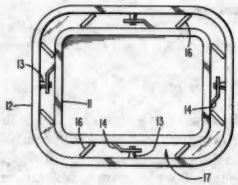
## FRAME CENTERING APPARATUS

**Daniel E. Craig, Marion; Clarence E. Walker, Jr., Anderson, both of Ind., and Leonard P. Wilbur, Jr., Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.**

**Filed May 22, 1985, Ser. No. 736,824**

**Int. Cl.[4] H01J *9/00***

**U.S. Cl. 445—68** **6 Claims**



1. Apparatus for centering a frame in an object, said frame and said object being similarly configured whereby a space exists between the outer periphery of said frame and the inside border of said object, said apparatus comprising:

a fixed plate; a plurality of substantially rectangular blades rotatably mounted in said fixed plate, the largest dimension of said blades exceeding the width of said space said blades being spaced about said fixed plate whereby said blades enter said space on all sides of said object, each of said blades including coupling means

a movable plate arranged substantially parallel to said fixed plate, said movable plate slideably engaging said coupling means; and

means for moving said movable plate whereby said blades are rotated by said coupling means to engage said frame and said object and urge said frame into a centered position within said object.

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**4,610,637**

## TOY VEHICLE HAVING ROTATING ELEMENT

**Edward Ferguson, Torrance, Calif., assignor to Tomy Kogyo Co. Inc., Tokyo, Japan**

**Filed Apr. 8, 1985, Ser. No. 720,995**

**Int. Cl.[4] A63H *17/00***

**U.S. Cl. 446—237** **4 Claims**

1. A toy which comprises:

a vehicle body;

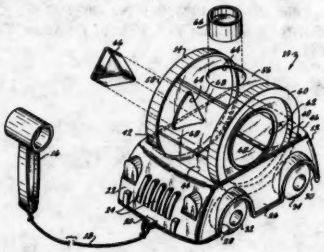
said vehicle body including left and right side walls and a further wall, said further wall being arcuate in shape and extending between said left and right side walls from front to back on said vehicle body, together said side walls and said further wall forming an upwardly opening cavity in said body;

four wheels located in first and second sets, said wheels being rotatably mounted on said body in association with said further wall with at least a portion of each of said wheels extending below said body to support said body as said wheels rotate on a support surface;

said further wall including four openings located therein, said respective openings in said further wall extending

into the left and right side walls adjacent to said further wall, said openings positioned in said further wall and said side walls, in locations aligned over said wheels whereby a portion of each of said wheels extends upwardly through the respective opening with which it is associated partly through said further wall and partly through one of said left and right side walls;

an element, said element formed as a surface of rotation;



said element sized and shaped so as to partially fit within said cavity with its axis of rotation parallel to those of said wheels and with said surface of rotation of said element resting on said portions of said wheels which extend upwardly through said openings in said further wall and said side walls whereby as said wheels rotate in conjunction with movement of said vehicle body across said support surface, said rotation of said wheels is transferred to said surface of rotation of said element to rotate said element within said cavity.

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**4,610,638**

## INFANT ACTIVITY TOY

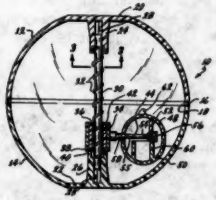
**Noriaki Iwao, and Fuyuki Katsumata, both of Tokyo, Japan, assignors to Tomy Kogyo Co. Inc., Tokyo, Japan**

**Filed Apr. 23, 1985, Ser. No. 726,023**

**Claims priority, application Japan, Apr. 26, 1984, 59-61932[U]**

**Int. Cl.[4] A63H *1/06***

**U.S. Cl. 446—241** **14 Claims**



1. An activity toy which comprises:

an invertible spherical housing having a hollow interior, at least a portion of said housing being transparent so as to allow viewing of said hollow interior of said housing;

an elongated helical member located within said hollow interior of said housing;

said housing includes first and second flat support areas located on the outside thereof, said first and said second support areas positioed on opposite sides of said spherical housing;

said helical member located within said housing so as to extend between said first and said second flat support areas;

said housing positionable on said first support area and when inverted positionable on said second support area;

a cylindrical bushing located around and encircling a portion of said helical member, said bushing sized and shaped so as to weakly frictionally engage said helical member whereby said bushing rotates around said helical member in response to movement of said bushing along the length of said helical member;

a cylindrical collar having a hollow interior and open ends, said bushing located within the interior of said collar with said helical member passing through the ends of said collar, said cylindrical collar sized and shaped so as to encase said bushing within said interior of said collar and including means located on said collar for retaining said bushing within the interior of said collar and to allow said bushing to rotate both clockwise and counterclockwise within said interior of said collar when said housing is positioned on both said first support area and said second support area;

further means attaching to said collar to increase the mass of said collar whereby upon inversion of said housing said mass of said further means and said collar and said bushing rotate as said bushing travels down said helical member and said further means and said collar continue rotating around said bushing when said bushing reaches the limit of its downward travel along the length of said helical member.

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**4,610,639**

## SIMULATED FLYING CREATURE WITH FLAPPABLE WINGS

**Pietro Piazza, Prospect, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.**

**Filed Feb. 20, 1985, Ser. No. 703,305**

**Int. Cl.[4] A63H *3/14***

**U.S. Cl. 446—327** **18 Claims**

1. In a toy winged creature having manually actuated flappable wings, the combination comprising: a one-piece, semirigid, generally planar wing member having a central portion, outer wing portions extending in generally opposite directions therefrom, and a pair of laterally spaced, transversely extending rib elements therebetween projecting from the general plane of said wing member, said outer portions being resiliently deflectable relative to one another by manual force applied to said central portion; and a creature body having an upwardly opening cavity formed therein with lateral upper edges defined by elements of said body, said wing member being loosely mounted upon said body with said outer portions extending laterally therefrom and with said central portion positioned over said cavity, said body also having laterally spaced elements thereon disposed outwardly of said rib elements for retaining said wing member and extending transversely thereover in general registration with said lateral edge-defining elements of said body, whereby an operator can insert his finger between said retaining elements to depress said central portion of said wing member into said cavity, thereby causing said edge-defining elements of said body to deflect said outer wing portions upwardly about said retaining elements, with alternate application and release of such force being effective to simulate flapping motion of said wing member, said rib elements being disposed for interception against said retaining

elements to prevent substantial lateral displacement of said wing member as a whole, with respect to said body.

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**4,610,640**

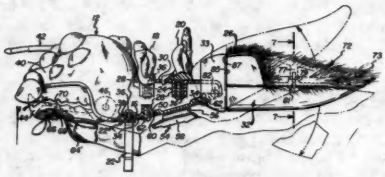
## GLOVE PUPPET FIGURE ASSEMBLY WITH ARTICULATED HEAD COMPONENTS

**Francis R. Amici, Northford; Hans S. Berger, Plainville; Domenic G. Mercurio, Elmwood; John P. McNett, Farmington, and Pietro Piazza, Prospect, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.**

**Filed Feb. 21, 1985, Ser. No. 703,732**

**Int. Cl.[4] A63H *3/14***

**U.S. Cl. 446—329** **19 Claims**



1. A puppet figure assembly comprised of:

a puppet figure including a body portion, a separate head component, and a separate tail portion, both of said portions being relatively rigid and substantially hollow, said tail portion being pivotably mounted upon said body portion for articulation about a transverse axis thereof, and said head component being pivotably mounted upon said body portion for articulation about a transverse axis spaced to the opposite end thereof from said tail portion; and

rigid holding means on said body portion adapted to be gripped by the hand of the operator for preventing substantial movement thereof relative thereto, said puppet figure being dimensioned and configured to position at least a substantial part of said tail portion beyond the wrist add over the forearm of the operator with said holding means so gripped, whereby said tail portion can be pivoted with respect to said body portion by movement of the operator's hand relative to his forearm, and also to position said head component for movement by the finger of the same hand with said holding means so gripped by the operator.

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**4,610,641**

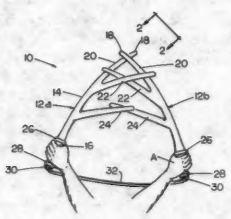
## DEVICE FOR ATTRACTING DEER AND ELK

**Charles E. Allen, 120 Denman #9, Lufkin, Tex. 75901**

**Filed Jun. 7, 1984, Ser. No. 617,955**

**Int. Cl.[4] A63H *5/00***

**U.S. Cl. 446—397** **11 Claims**



1. A device for attracting deer and elk comprising a pair of members made of a rigid synthetic polymer, each of said members including an elongate portion with a manually graspable handle near one end and at least two prongs formed on each of said elongate portions, said handle including annularly protruding means arranged to protect the user's hand.

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**4,610,642**

## RING SEGMENT CONNECTION ARRANGEMENT FOR LINK COUPLING

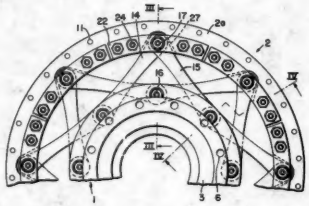
**Ulrich Falz; Manfred Lunke, both of Dortmund, and Jürgen Walter, Haltern, all of Fed. Rep. of Germany, assignors to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany**

**Filed Feb. 21, 1985, Ser. No. 703,892**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406681**

**Int. Cl.[4] F16D *3/60***

**U.S. Cl. 464—69** **7 Claims**



1. In a link coupling having an axis of rotation and having at least two coupling parts, namely at least one coupling hub and one outer coupling flange, with said coupling parts being interconnected stiff against torsion by links which are disposed in a location at a tangent to the axis of rotation of said coupling; said links having ends and being arranged in pairs at an angle to one another, with the ends thereof being alternately connected, by bolts, to said hub and to said outer coupling flange; the link end connection to at least one of said coupling parts comprising circumferentially spaced recesses receiving the respective link end pairs with a first clearance; ring segments connected to said link end pairs by said bolts and being detachably and frictionally connected to said at least one coupling part by fastening means; said ring segments being circumferentially spaced apart by a predetermined distance; said fastening means comprising fastening members and bores in each of said ring segments and said at least one coupling part for receiving said fastening members; the bores of at least one of said ring segments and at least one coupling part being larger than the cross-section of said fastening members so that said fastening members are held with play in the bores and are surrounded with clearance.

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**4,610,643**

## ROTARY CONSTANT VELOCITY UNIVERSAL JOINT

**Werner Krude, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany**

**Continuation of Ser. No. 475,379, Mar. 14, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,851**

**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209596**

**Int. Cl.[4] F16D *3/24***

**U.S. Cl. 464—143** **11 Claims**

1. A rotary constant velocity universal joint, comprising:

an outer hollow joint member having an inner wall with curved grooves formed therein and a first shaft member connected thereto;

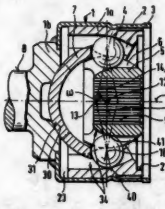
an inner joint member arranged in said outer joint member having an outer wall provided with a number of curved grooves corresponding to the number of said curved grooves in said outer joint member and a second shaft member connected thereto;

a plurality of torque-transmitting balls received in said

grooves in torque-transmitting engagement between said inner and outer joint member, each of said grooves comprising a groove base and a track base area along which said balls are supported, said balls being in contact with said track base area across an angle δ extending angularly equidistantly from both sides of said groove base;

said grooves in said inner and in said outer joint members having a curved configuration such that each pair of said grooves consisting of one groove of each of said outer and inner joint member is arranged to form a jaw-like opening through which said balls may pass in one direction axially of said joint, said jaw-like opening facing toward the direction of said first shaft member;

a supporting element engaging said balls from only the side thereof facing toward said first shaft member to prevent



said balls from passing through said jaw-like opening to hold said balls in torque-transmitting engagement within said curved grooves of said inner and outer joint members;

said supporting element being held within said joint so as to be movable relative to both said inner and outer joint members whereby it may be angled freely relative thereto in all directions of articulation of said joint;

said curvature of said grooves in both said inner and outer joint members being formed such that a connecting line extending between the center of the radius of curvature of each of said grooves and the center of said torque-transmitting balls forms an angle ω relative to the axis of rotation of said respective joint member, said angle ω being smaller than or equal to 80° and said angle δ being smaller than or equal to 50°.

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**4,610,644**

## DERAILLEUR FOR A BICYCLE

**Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan**

**Filed Feb. 14, 1984, Ser. No. 579,965**

**Claims priority, application Japan, Feb. 23, 1983, 58-30097; Nov. 2, 1983, 58-206213**

**Int. Cl.⁴ F16H 7/22**

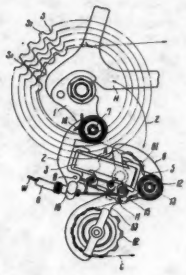
**U.S. Cl. 474—82** **7 Claims**

1. A derailleur for selectively shifting a driving chain to one sprocket of a multistage sprocket assembly comprising,

a fixing member,

a transformable linkage mechanism comprising a base member, two linkage members and a movable member, and

a chain guide supported to said movable member and provided with a guide pulley for guiding said chain to said multistage sprocket assembly and a tension pulley, said linkage mechanism being supported swingably to said fixing member through a first horizontal shaft, said chain guide being supported swingably to said movable member through a second horizontal shaft, said derailleur having between said chain guide and said movable member a first spring for applying tension to said chain, and between said fixig member and said linkage mechanism a second spring for biasing said linkage mechanism in a direction of said guide pulley moving away from the axis of said sprocket assembly, and being provided with a forcibly moving mechanism which, when said linkage mechanism is transformed, moves said guide pulley axially of said sprocket



assembly and radially thereof in a plane perpendicular to the axis of said sprocket assembly.

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**4,610,645**

## BELT STRETCHER UNIT DESIGNED FOR ASSEMBLY ON A FLEXIBLE DRIVE PARTICULARLY ON A MOTOR VEHICLE

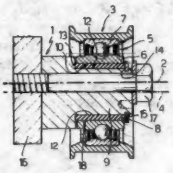
**Vittorio Donn, and Paolo Bertetti, both of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy**

**Filed Mar. 8, 1985, Ser. No. 709,520**

**Claims priority, application Italy, Mar. 9, 1984, 53082/84[U]**

**Int. Cl.⁴ F16H 7/10**

**U.S. Cl. 474—112** **9 Claims**



1. A belt stretcher unit designed for assembly on a drive having an endless flexible member, particularly for a motor vehicle, said unit comprising:

a pin having an outer surface and designed to be mounted on said motor vehicle and designed to pivot around a first axis;

a pulley being supported on said pin by means of at least one rolling bearing, said rolling bearing having an inner ring and an outer ring, said pulley mounted for rotation about a second axis eccentric with said first axis; and

an elastic tubular element for maintaining said pulley in constant contact with said endless flexible member, said tubular element interposed between said pin and said rolling bearing; and

a pair of axial shoulders positioned at each end of said elastic tubular element whereby said elastic tubular element is entirely locked between said inner ring of said rolling bearing, said outer surface of said pin, and said pair of axial shoulders.

## 4,610,646
## ROLLER, ESPECIALLY A TENSION ROLLER FOR A BELT DRIVE

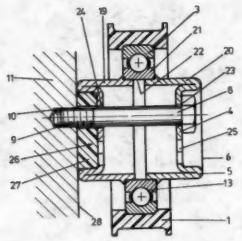
**Lothar Walter, Schweinfurt; Manfred Brandenstein, Eussenheim, and Armin Olschewski, Schweinfurt, all of Fed. Rep. of Germany, assignors to Skf Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany**

**Filed Aug. 24, 1981, Ser. No. 295,248**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1980, 8025902**

**Int. Cl.[4] F16H** *7/20, 55/36*

**U.S. Cl. 474—198** **8 Claims**




1. In a roller assembly comprised of a hollow hub comprised of a cylindrical sleeve having a closed end forming a bottom wall with an aperture extending therethrough for a receiving a mounting screw, a rotatable roller, and rolling bearing means supporting said roller on said hub; the improvement where said hub has an end surface, said bottom wall being set back from said end surface a distance at least equal to the wall thickness of said bottom wall, the periphery of said bottom wall being joined to said end surface by an axially extending annular rim, said axially extending annular rim defining a stiffening double fold in the material of said cylindrical sleeve, the folds of said double fold being in substantial contact one with the other along a cylindrical axial surface.

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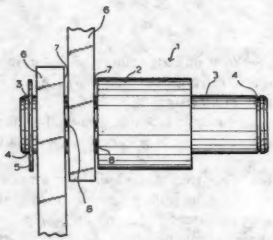
## 4,610,647
## CHAIN LINK CONNECTION

**Arthur Weeds, Auckland, New Zealand, assignor to McKenzie & Ridley Limited, Auckland, New Zealand**

**Continuation of Ser. No. 686,627, Dec. 31, 1984, abandoned, which is a continuation of Ser. No. 559,419, Dec. 8, 1983, abandoned. This application Sep. 26, 1985, Ser. No. 780,705**

**Int. Cl.[4] F16G** *13/02*

**U.S. Cl. 474—206** **8 Claims**




1. A connection for chain links comprising:

a connector having a main body portion and an elongate support bar extending outwardly from at least one side of said main body portion and having a smaller cross-sectional area than that of said main body portion to form a shoulder therebetween;

an annular groove in said elongate support bar adjacent a distal end thereof remote from said shoulder, the distance between said shoulder and groove being predetermined to allow a plurality of chain links to be mounted on and engaged with said support bar with faces on said chain links in adjacent facing relationship;

a retaining clip engaged in said groove for retaining said chain links in position on said support bar between said shoulder and said retaining clip; and

at least one raised portion on at least one of said adjacent faces of said chain links so that said raised portion is between said adjacent faces and engageable with the other of said adjacent faces for maintaining said adjacent faces of said chain links in relative spaced relationship with open space between said adjacent faces.

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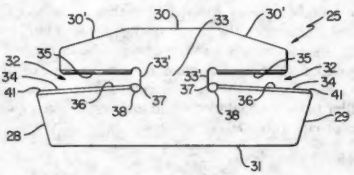
## 4,610,648
## BELT CONSTRUCTION FOR A CONTINUOUSLY VARIABLE TRANSMISSION, TRANSVERSE BELT ELEMENT THEREFOR AND METHODS OF MAKING THE SAME

**Joseph P. Miranti, Jr., Porter Township, Mo., assignor to Dayco Corporation, Dayton, Ohio**

**Filed Oct. 31, 1983, Ser. No. 547,272**

**Int. Cl.[4] F16G** *1/21*

**U.S. Cl. 474—242** **60 Claims**

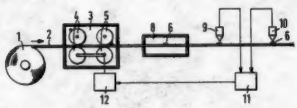



1. In a belt construction for a continuously variable transmission, said belt construction having an endless flexible band means, and a plurality of belt elements carried by said band means in sliding relation therewith, each belt element having slot means receiving said band means therein and having opposed faces disposed in compressed relation against adjacent faces of adjacent belt elements, each belt element having opposed sides for respectively engaging pulley faces of said transmission, said slot means for each belt element defining a pair of slots respectively interrupting said opposed sides thereof and being spaced from each other by a central stem portion of said element, said pair of slots for each element receiving parts of said band means therein and respectively defining a pair of shoulders engaging said parts of said band means, each shoulder of each belt element having a transverse surface provided with an apex that engages its respective part of said band means, said apex of each transverse surface of its respective belt element being offset relative to the center between its respective side and its respective central stem to tend to bias its respective part of said band means toward its respective central stem rather than toward its respective side, the improvement wherein said apex of each transverse surface of each belt element is disposed between its respective center and its respective stem.

## 4,610,649
## METHOD OF MANUFACTURING PLASTIC-COATED PACKAGES TO HOLD LIQUIDS

**Hans Friess, Linnich, Fed. Rep. of Germany, assignor to PLK Papier-und Kunstoff Werk Linnich GmbH, Dusseldorf, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 315,355, Oct. 26, 1981, abandoned. This application Jul. 16, 1984, Ser. No. 631,035**
**Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041050**
**Int. Cl.[4] B31B** *1/88, 3/14;* **B41F** *13/56;* **B65H** *20/00*
**U.S. Cl. 493—11** **1 Claim**



1. Process for the manufacture of a printed coated cardboard blank for use in forming a package for liquids which package has a perforated or rip-out opening preformed there-through at a predetermined position with respect to the printed message on the package; said process comprising the steps of

advancing a cardboard web past a punching or perforating and registration mark applying station;

punching or perforating a portion of said cardboard web and applying registration marks at the station in said cardboard web at a predetermined position with respect to said portion;

keeping substantially constant the distance between successive registration marks by monitoring said distance between successive registration marks downstream from the station, and in response to such distance adjusting the punching or perforating and registration mark applying speed at the station relative to the speed at which the web advances past the station; thereafter

coating said cardboard web with a suitable liquid resistant coating before further processing; and thereafter

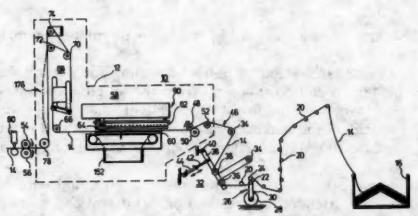
applying the printed message at a predetermined position with respect to said registration marks whereby said printed message is applied in a predetermined position with respect to said punched or perforated portion of said cardboard web,

and cutting said printed coated cardboard web into blanks.

## 4,610,650
## PLASTIC BAG HANDLE FORMING APPARATUS

**David C. Piggott, Ontario, Canada, assignor to PCL Packaging Limited, Oakville, Canada**

**Filed Feb. 7, 1984, Ser. No. 577,712**
**Int. Cl.[4] B31B** *1/64*
**U.S. Cl. 493—204** **3 Claims**



1. A bag making machine comprising apparatus for forming bag handles from a plastic web material and means for passing the web material through said apparatus, said apparatus comprising:

stationary cutting means shaped to cut said bag handles,

movable support means over which the web material travels, said support means being movable between a first position spaced from the cutting means and a second position forcing the web material into cutting engagement with the cutting means,

reciprocally movable drive means,

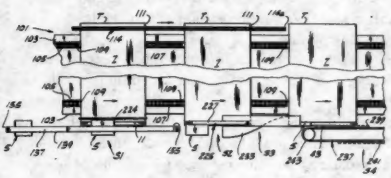
coupling means interconnecting said drive means and said support means to translate reciprocating movement of said drive means into intermittent movement of the support means between said first and second positions,

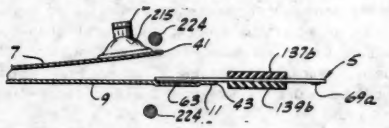
said coupling means comprising a pair of axels extending transversely of the directions of travel of the web material and longitudinally spaced in said direction, each axel carrying cam means engagable with the support means, a first flexible endless drive element in driving engagement with the axels adjacent one end thereof, a second flexible endless drive element in driving engagement with the axels adjacent opposite ends thereof, and said drive means comprising fluid pressure operated piston and cylinder means for each flexible endless drive element.

## 4,610,651
## METHOD OF AND APPARATUS FOR MANUFACTURING BAGS WITH TABS

**Roger K. Jacobson, Ramsey, and Ronald W. Munson, Minneapolis, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.**

**Division of Ser. No. 480,573, Mar. 30, 1983, Pat. No. 4,515,273. This application Oct. 1, 1984, Ser. No. 656,360**
**Int. Cl.[4] B31B** *1/90, 1/80, 1/36*
**U.S. Cl. 493—212** **30 Claims**





1. The method of making bags each with a pinch closure at one end and a tab for opening it at its closure from bag tubes each having first and second walls with an extension of the second wall beyond the first at said one end of the tube, each wall having an inside face and an outside face, an end portion of the tube at its said one end being foldable over on the first wall of the tube on a first fold line spaced inwardly from the end edge of said first wall at said one end of the tube to form a closure flap, said method comprising:

feeding the bag tubes forward one after another in a predetermined path of travel with the tubes extending transversely with respect to said path of travel, the tubes travelling through a first station for application of a tab, thence through a station for folding of the tab and thence through a station for folding of the closure flap;

feeding tabs forward one after another and bringing each tab into a position at said one end of a tube at said first station with part of the tab on the portion of the inside face of the

second wall included in the extension and an outer part of the tab extending out beyond the end edge of said extension a distance greater than the spacing of said first fold line from the end edge of said extension, and adhering the tab to said extension;

folding said outer part of each tab over on a second fold line adjacent said end edge of the extension to overlie the outside face of said second wall at said tab folding station, and releasably adhering said outer part of the tab to the outside face of said second wall with the outer end of the tab disposed for being grasped and pulled away from the second wall; and

folding said closure flap of each tube over on said first fold line to overlie said first wall of the tube at said closure flap folding station and adhering it thereto to form a pinch closure at said one end of the tube, that part of the tab between said first and second fold lines folding over with the flap and being adhered along with the flap to said first wall, said outer part of the tab being folded on said first fold line as the flap is folded over and ending up with a portion on the outside of the flap and a portion on the outside of the second wall releasably adhered to the second wall and disposed for being torn away from the second wall and pulled to tear the bag open at the closure.

**14**. Apparatus for making a bag with a pinch closure at one end and a tab for opening it at the closure from a bag tube having first and second walls with an extension of the second wall beyond the first at one end of the tube, each wall having an inside face and an outside face, an end portion of the tube at its said one end being foldable over on the first wall of the tube on a first fold line spaced inwardly from the end edge of said first wall at said one end of the tube to form a closure flap, said apparatus comprising:

a first station for application of a tab; a second station for folding of a tab; a third station for folding of said closure flap;

means for bringing a tube to said first station for application of a tab, thence to said second station for folding of the tab and thence to said third station for folding of said closure flap;

means adjacent said first station for applying a tab to the tube at its said one end at said first station with part of the tab on the portion of the inside face of the second wall included in said extension and an outer part of the tab extending out beyond the end edge of said extension a distance greater than the spacing of said first fold line from the end edge of said extension, and adhering the tab to said extension;

means at said tab folding station for folding said outer part of the tab over on a second fold line adjacent said end edge of the extension to overlie the outside face of said second wall, and releasably adhering said outer part of the tab to the outside face of said second wall with the outer end of the tab disposed to be grasped and pulled away from the second wall; and

means at said closure flap folding station for folding said closure flap over on said first fold line to overlie said first wall of the tube and adhering it thereto to form a pinch closure at said one end of the tube, that part of the tab between said first and second fold lines folding over with the flap and being adhered along with the flap to said first wall, said outer part of the tab being folded on said first fold line as the flap is folded over and ending up with a portion on the outside of the flap and a portion on the outside of the second wall releasably adhered to the second wall and disposed to be torn away from the second wall and pulled to tear the bag open at the closure.

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## CONTROL FOR A FOLDING FLAP OF A FOLDING CYLINDER IN A FOLDING MACHINE OF A ROTARY PRINTING MACHINE

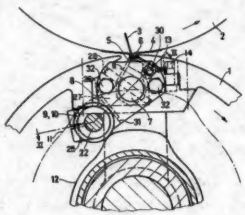
**Manfred Henn, Heidelberg, and Walter Darda, Eppelheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 499,194, May 31, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 765,170**

**Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220414**

**Int. Cl.**[4] **B31F** *1/00*

**U.S. Cl. 493—432** **4 Claims**



**1**. Control for a folding flap of a folding cylinder in a folding machine of a rotary printing machine wherein a counterflap is adjustable with respect to a folding blade to a thickness of paper being processed, the folding flap being controlled by means of a closed cam, comprising: a folding flap having an associated journal, a roller lever formed of a first part mounted on the journal of the folding flap, and a second part adjacent the first part, the second part bearing a cam roller, said first and second parts being adjustable with respect to one another for changing the angular position of the folding flap so as to vary a spacing between the folding flap and the folding blade.

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**4,610,653**

## HEAT SEALING AND CUTTING MEANS

**Peter P. Savich, Long Meadow, Mass., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed May 1, 1985, Ser. No. 729,363**

**Int. Cl.**[4] **B31B** *23/14;* **B26D** *7/10;* **B26F** *3/12;* **B32B** *31/18*

**U.S. Cl. 493—470** **7 Claims**

**2**. A heat sealing and cutting means for thermoplastic material comprising:

(a) an elongated electrically heated sealing and cutting wire having an end portion bent from the longitudinal axis of said wire so as to form a generally L-shaped relatively inflexible bend and said wire having adjacent said bend a load bearing surface extending normal to said longitudinal axis;

(b) a wire support including a pivotable arm, said wire end portion extending generally along said arm and said arm having a load bearing surface engageable against said load bearing surface on said wire;

(c) bias means operatively connected to said arm for urging said arm to pivot in a direction which maintains the engagement of said load bearing surfaces and keeps said wire

taut as it expands and contracts responsive to the heating and cooling of said wire;

(d) means rigidly attaching said wire end portion to said pivotable arm at a location spaced along said end portion and remote from said bend; and

(e) said wire end portion, in a section between said inflexible bend and said location of rigid attachment to said arm, having a generally U-shaped form with a rounded base and straight sides extending from the rounded base, which sides flex open or close responsive to the pivotal movement of said arm.

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## GUIDE STRUCTURE FOR APPARATUS FOR SACK END FORMING APPARATUS

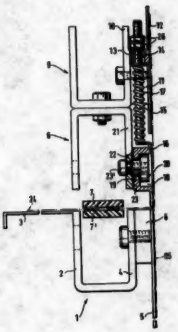
Horst Rautenberg, Lienen, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,130

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405066

Int. Cl.[4] B31B *1/00*

U.S. Cl. 493—477 5 Claims



1. A structure for guiding tubular blanks through a sack end forming station through which the tubular blanks are transversely conveyed on a path of travel, said structure comprising two plates, which are disposed on opposite sides of said path of travel, and guiding surfaces associated with said plates and defining adjacent to said path of travel a gap which has a width that is at least as large as the thickness of the tubular blank, characterized in that at least one of said guiding surfaces is formed by a bar, which is associated with one of said plates and capable of a limited movement in the plane of said plate and is urged toward the other plate by springs.

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## APPARATUS FOR THE MANUFACTURE OF PAPER CONTAINERS

Berthold Müller, Süssen, Fed. Rep. of Germany, assignor to Michael Horauf Maschinenfabrik GmbH & Co. KG, Sussen, Fed. Rep. of Germany

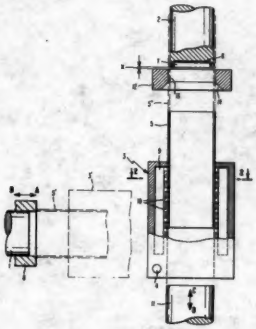
Filed May 22, 1984, Ser. No. 613,035

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323190

Int. Cl.[4] F16H *7/22*

U.S. Cl. 493—108 11 Claims

1. An apparatus for the manufacture of paper containers, comprising: a cylindrical first support mandrel upon which a cylindrical container jacket is wound and sealed; a cylindrical second support mandrel upon which the container jacket is inserted for the installation of a container bottom into the container jacket, said second mandrel having an end edge on one end and an outer peripheral surface of a given size and shape extending from said end edge, said one end arranged to carry said container bottom and insert same into said jacket when said jacket is inserted onto said second mandrel; transfer means arranged between said first and second mandrels for receiving the container jacket completely removed from said first mandrel and pushing said jacket onto said second mandrel toward and beyond said end edge thereof such that said jacket is inserted onto said peripheral surface in sliding engagement therewith to locate said bottom within said jacket; said transfer means including curved surface means having a curvature corresponding substantially to that of said jacket for receiving said jacket as the latter is removed longitudinally from said



first mandrel; and positioning means including a passage therethrough and disposed adjacent to and in alignment with said end edge of said second mandrel, said transfer means arranged to push said jacket through said passage and onto said outer peripheral surface of said second mandrel for aligning said jacket with said second mandrel and simultaneously shaping the cross-section of said outer surface to facilitate the insertion of said jacket onto said second mandrel, said passage including a cylindrical inner surface having a cross-sectional shape of said outer surface of said second mandrel and being slightly larger than said outer surface in accordance with the thickness of said jacket.

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## FULLY PORTABLE SEMI-AUTOMATIC MECHANICAL HEART-LUNG SUBSTITUTION SYSTEM AND METHOD

J. D. Mortensen, Salt Lake City, Utah, assignor to Mehealus Partnership, Sandy, Utah

Filed Aug. 21, 1984, Ser. No. 642,833

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—4 67 Claims

56. A heart-lung substitution system comprising:

first cannula means adapted for insertion into a vein of a patient and comprising means for sensing venous blood pressure within said vein as blood is pumped through said first cannula means;

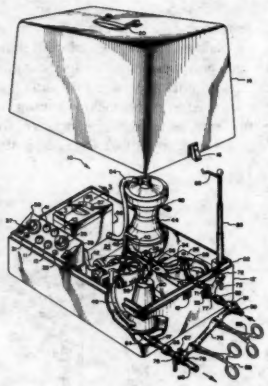
means for pumping blood from said vein through said first cannula means;

means for controlling the speed of said means for pumping blood from said vein such that the speed of said means for pumping blood is automatically increased as said venous blood pressure increases and said speed is automatically decreased as said venous blood pressure decreases;

means for oxygenating said blood;

means for pumping said oxygenated blood back to said

patient comprising a solenoid-actuated pressure plate pump; and



second cannula means for insertion into an artery of said patient for returning said oxygenated blood to said artery of said patient.

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**URETERAL STENT**

**David C. Densow, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.**

**Continuation of Ser. No. 567,757, Jan. 3, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 771,161**

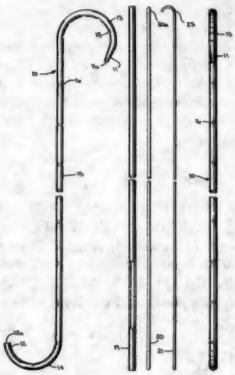
**Int. Cl.[4] A61M *25/00***

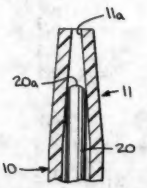
**U.S. Cl. 604—8** **3 Claims**

1. In a ureteral stent comprising an elongated tubular member of substantially uniform outside diameter throughout its length and having its proximal and distal ends set in the form of hooks, said member having central lumen and at least one drainage opening extending through a wall connecting the lumen to the outside, the improvement which comprises said member having a lumen which tapers inwardly adjacent the proximal end to terminate in an opening at the proximal end which is smaller in diameter than the main portion of lumen, said opening serving to allow the passage of a thin guide wire to maneuver past an obstacle and also serving to block the exit of a thick insertion wire from the lumen so that the thick insertion wire can be used to push the stent into a desired position in a patient's ureter.

2. A kit for use in inserting a stent into an ureter, said kit containing a ureteral stent of claim 1 and a guide wire, said guide wire having one relatively thick end which is smaller than the lumen of the stent and larger than the opening in the proximal end, and an other end which is relatively thinner than both the lumen and the proximal opening, said guide wire serving as both an insertion device by inserting the think end first into the lumen to insert the stent into an unobstructed ureter and as an obstruction bypassing device to bypass an obstruction in the ureter by inserting the other end into the lumen first and out the proximal end of the stent past said obstruction so that the stent can be advanced over the guide wire past the obstruction.

3. A kit for exchanging a new ureteral stent for an indwelling stent in the ureter of a patient, said kit comprising a new ureteral stent of claim 1 and an elongated thin guide wire which is thinner than both the lumen of the stent and the opening in the proximal end so that one end of the guide wire can be inserted into the distal opening and completely through the lumen of the stent and out the proximal opening into the open distal end of an open-ended indwelling stent in the ureter of a patient so that the indwelling stent can be removed by running it out along said guide wire without removing the guide wire and a






new ureteral stent can be run up the guide wire into position in the ureter of the patient.

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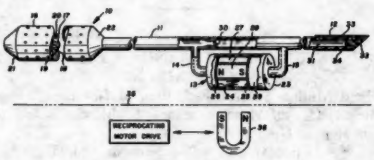
**AUTOMATED PERITONEOVENOUS SHUNT**

**Henry Buchwald, c/o University of Minnesota Medical School, Minneapolis, Minn. 55455; Eugenio Guzman, 2710 N. Dale, #204, Roseville, Minn. 55113, and Bruce D. Wigness, University of Minnesota, 2630 University Ave. S.E., Minneapolis, Minn. 55455**

**Filed Feb. 21, 1985, Ser. No. 703,758**

**Int. Cl.[4] A61M *5/00***

**U.S. Cl. 604—9** **10 Claims**




1. In an implantable anti-reflux fluid displacement pertoneovenous shunt system which comprises a fluid collecting device, a anti-reflux anti-backdiffusion, pump, an anti-reflux anti-backdiffusion non-thrombogenic catheter, and flexible tubing connecting said collecting device and pump and said pump and catheter in series, the improvement which consists in providing, as the pump of said shunt system, a magnetically driven pump having at least one variable volume chamber, a movable pumping mechanism for varying the volume of said chamber, and said pump including a magnetic armature cou-

pled to drive the pumping mechanism and adapted for operation by a magnetic drive external of the body in which the shunt system is to be implanted.

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## TAMPON PACK

**Axel Friese, Wuppertal, Fed. Rep. of Germany, assignor to Johnson & Johnson G.m.b.H., Dusseldorf, Fed. Rep. of Germany**

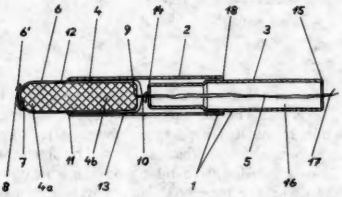
**PCT No. PCT/DE84/00021, § 371 Date Sep. 21, 1984, § 102(e) Date Sep. 21, 1984, PCT Pub. No. WO84/02840, PCT Pub. Date Aug. 2, 1984**

**PCT Filed Jan. 26, 1984, Ser. No. 662,423**

**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302932**

**Int. Cl.⁴ A61F *13/20***

**U.S. Cl. 604—11** **7 Claims**




1. In a tampon pack, in particular for female hygiene comprising:

a tampon having an introduction end and a rear end; said tampon disposed in an applicator shell open at both the introduction end and the rear end; a plunger telescopically mounted in said rear end of said applicator shell and axially moveable therein to push said tampon out of said applicator shell; the improvement comprising:

said tampon being essentially totally enclosed, within said applicator shell, by a flexible packaging film; said film being formed into a closure adjacent the rear end of said tampon; said film being affixed to said applicator shell; opening means in said film for opening the film to allow the passage of the introduction end of the tampon therethrough;

whereby, said tampon is protected from humidity prior to use and may be ejected from said shell by operating said opening means and pushing said tampon from said shell with said plunger while said film remains affixed to said shell.

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**4,610,660**

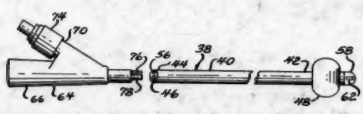
## METHOD OF PERFORMING A NEPHROSTOMY PROCEDURE WITH CONNECTOR ASSEMBLY

**Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.**

**Filed Dec. 18, 1984, Ser. No. 683,054**

**Int. Cl.⁴ A61M *25/00***

**U.S. Cl. 604—49** **2 Claims**




1. A method of performing a nephrostomy procedure comprising the steps of:

establishing a pathway to the renal calyces;

inserting an inflatable sleeve catheter with a proximal connector and an inflation valve a catheter into a patient's body until a distal portion of the catheter is located in the renal calyces;

inflating a sleeve of the catheter in the renal calyces;

removing a proximal connector and valve of the catheter such that the sleeve deflates;

telescopically passing a sheath of a scope over a shaft of said catheter located in the patient's body;

removing the catheter through the sheath; and

inserting a telescope of the scope through the sheath.

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**4,610,661**

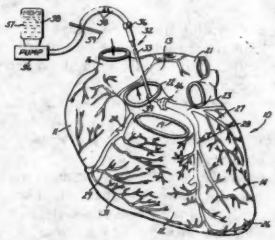
## PERFUSION DEVICE

**Zinon C. Possis, and Demetre M. Nicoloff, both of Edina, Minn., assignors to Possis Medical, Incorporated, Minneapolis, Minn.**

**Filed Jun. 13, 1984, Ser. No. 620,380**

**Int. Cl.⁴ A61M *31/00***

**U.S. Cl. 604—52** **27 Claims**




19. An apparatus for transporting a cardioplegic fluid from a supply of cardioplegic fluid to a coronary artery having a blood inlet opening in the aorta to perfuse the coronary artery with cardioplegic fluid, said apparatus comprising: an elongated tube having passage for carrying cardioplegic fluid, said tube having an inlet end adapted to be connected to a supply of cardioplegic fluid and an outlet end with a pliable annular member mounted thereon, said member having a passage for carrying cardioplegic fluid from said tube and a continuous generally circular outer end having a diameter larger than the transverse size of the blood inlet opening of the coronary artery whereby when said generally circular outer end may be held in engagement with an annular portion of the aortic tissue surrounding the blood inlet opening of the coronary artery so that cardioplegic fluid may flow from said annular member through said inlet opening and into the coronary artery.

23. A method for transporting a cardioplegic fluid from a supply of cardioplegic fluid to a coronary artery having a blood inlet opening in the aorta with an elongated tube having a passage for carrying cardioplegic fluid, said tube having an inlet end connected to a supply of cardioplegic fluid, and an outlet end with an annular pliable member mounted thereon, said annular member having a passage for carrying cardioplegic fluid from said tube and a continuous outer end having a transverse size larger than the size of the blood inlet opening of the coronary artery, said method comprising: surgically exposing the heart and opening the wall of the aorta to provide access to the aortic passage, introducing the outlet end of the tube and annular pliable member mounted thereon into the aorta passage, locating the annular pliable member in alignment with the blood inlet opening of the coronary artery with the annular outer end surrounding the blood inlet opening, holding the annular outer end in engagement with an annular portion of aortic tissue surrounding the blood inlet opening, and allowing cardioplegic to flow through said tube and into the coronary artery through said blood inlet opening.

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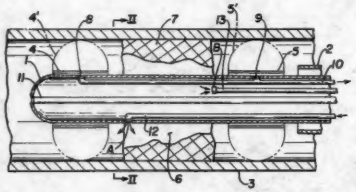
## METHOD FOR THE ELIMINATION OR THE ENLARGEMENT OF POINTS OF CONSTRICTION IN VESSELS CARRYING BODY FLUIDS

Andreas Weikl, and Volkmar Merkel, both of Erlangen, Fed. Rep. of Germany, assignors to Schneider Medintag AG, Zurich, Switzerland

Filed Jul. 22, 1983, Ser. No. 517,069
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—53 10 Claims



1. A method of treating stenosis by eliminating or expanding the points of constriction which are customarily formed of a sponge-like calcified and fatty tissue in blood carrying vessels of the body through use of a flexible treatment catheter having separate support conduits formed by longitudinal partition walls and at whose end two balloons are situated, said method comprising the steps of sealing off the section of the blood vessel containing the stenosis with the two balloons, introducing a solvent of predetermined concentration and duration of effect to act upon the stenosis through a first support conduit in the catheter such that the tissue of the stenosis is dissolved, softened, or crumbled into smaller particles, and draining the particles from the sealed section of the blood vessel through a second separate support conduit.

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## NEPHROSTOMY CATHETER WITH SIDE CONNECTOR

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 18, 1984, Ser. No. 683,052
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—99 3 Claims

1. A nephrostomy catheter, comprising:

an elongated shaft having a drainage lumen extending through the shaft, a proximal end, an inflation lumen extending through a wall of the shaft, and an opening extending through the wall of the shaft at a location spaced distal from the proximal end of the shaft and communicating with the draingage lumen adjacent a proximal end of the shaft;

an elastic sleeve secured to a distal portion of the shaft in circumferential zones, with the sleeve defining a cavity communicating with the inflation lumen;

a connector removably received in sealing relationship in said opening with the connector communicating with the drainage lumen and extending to one side of the shaft;

an inflation valve secured to the proximal end of the shaft and generally aligned with the shaft; and

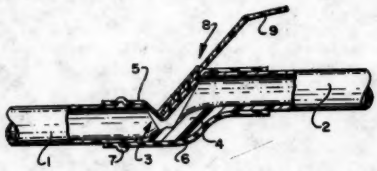
means for establishing communication between the valve and the inflation lumen wherein the establishing means comprises, a connector member having a distal plug received in a proximal portion of the drainage lumen, an annular flange surrounding and spaced from the plug, with the flange abutting against the proximal end of the shaft, and with the flange and plug defining an annular groove communicating with the inflation lumen.

4,610,664

## OPERATION ASPIRATOR WITH CONTROL VALVE

Anton Harle, Drechslerweg 40, Munster, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,076
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—119 7 Claims



1. A manual medical surgical aspiration device for the aspiration of body fluids consisting of two pieces of tubing at least one of which terminates in a diagonal face relative to its longitudinal axis forming a seat which are joined by an elastic tubing which forms a housing, said tubing having a flexible cutout pocket means having inner wall means which extend within said housing, a flap member means extending within said pocket means acts as a interruption member to control the level of vacuum in the device, an operating lever extending from the flap member exteriorly of said housing and directly connected to said flap member means to control the flap member means to force said inner wall means against said diagonal face such that in a quiescent condition said valve flap member means does not completely close off said diagonal face of said tubing, said housing further consisting of a single unitary piece of elastic tubing opposite said pocket means the ends of which are laterally offset to one another along the longitudinal axis.

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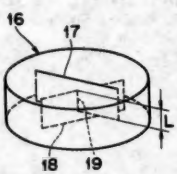
## MEDICAL INSTRUMENT

Atsushi Matsumoto, Chofu, and Tatsuo Suzuki, Yokohama, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,790
Claims priority, application Japan, Jan. 18, 1983, 58-5348; Mar. 7, 1983, 58-35939; Oct. 22, 1983, 58-196950
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—167 15 Claims



1. A medical instrument comprising:

a main body having a path extending therethrough, and wherein a rod-like member is insertable or drawable through said path; and

a valve body provided in said path of the main body for maintaining at least a liquid-tight seal with said rod-like member when said valve body is opened by said rod-like

member being passed through said valve body and through said path, and for closing said path at least in a liquid-tight state when said rod-like member is absent from said path, said valve body being made of a flexible and elastic material and being a single integral member;

said valve body having two end faces in said path;

said valve body further having a first slit openable in only one of said end faces and a second slit openable only in the other of said end faces, said first and second slits being oriented at an angle to each other;

said first slit and said second slit each extending only partly through said valve body and crossing each other within said valve body, said first and second slits intersecting each other at points below or between said end faces of said valve body but not at said end faces of said valve body; and

said rod-like member being insertable or drawable through said slits at the crossing of said slits.

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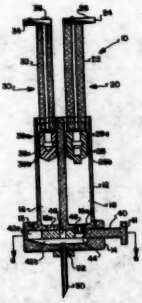
**4,610,666**

## DUAL SYRINGE

**Joanne L. Pizzino, 1426 Sugar Knoll, Akron, Ohio 44313**

**Filed Jun. 24, 1985, Ser. No. 747,935**
**Int. Cl.[4] A61M 5/08**
**U.S. Cl. 604—191** **17 Claims**



1. A syringe for injecting a plurality of liquids into a patient in predetermined sequence, said syringe comprising:

a main body portion having a plurality of barrels therein, each of said barrels being adapted to contain an injectable liquid;

a plunger in each barrel for injection of said liquid;

a valve body portion below said main body portion, said valve body portion having a manually operable valve therein and a free space on the outlet side of said valve for receiving said injectable liquids,

said valve being movable successively to a plurality of positions so as to place each of said barrels in communication with said free space in a predetermined sequence;

means for preventing movement of said valve in a sequence other than the predetermined sequence, whereby dispensing of liquids in an incorrect order is prevented; and

a needle in communication with said free space for injecting said liquids into a patient.

**4,610,667**

## DISPOSABLE SAFETY NEEDLE SHEATH

**James J. Pedicano, 222 N. Van Dien Ave., Ridgewood, N.J. 07450; James G. Kane, 3700 Oliver St., NW., Washington, D.C. 20015, and Ernest Pedicano, 11 Hertford St., New Rochelle, N.Y. 10801**

**Continuation-in-part of Ser. No. 609,343, May 11, 1984. This application Jan. 9, 1985, Ser. No. 689,909**
**Int. Cl.[4] A61F 5/32**
**U.S. Cl. 604—192** **25 Claims**

1. A disposable safety needle sheath for disposal of a used or otherwise unsanitary needle, comprising:

sleeve means closed at one end thereof and open at the opposite end thereof;

needle locking threads within said sleeve means to tightly engage the associated structure of an inserted needle and to effectively prevent a needle inserted into said sleeve means from being readily removed therefrom; and

needle receiving means communicating with the open end of said sleeve means for guiding a needle inserted therein towards the open end of said sleeve means.

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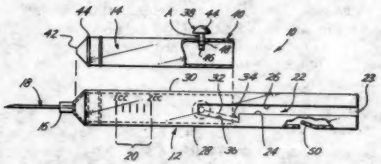
**4,610,668**

## PRESELECTED MULTIPLE DOSAGE SYRINGE

**John A. Fleig, Rte. 5, Box 3442, Sulphur, La. 70663**

**Filed Oct. 2, 1985, Ser. No. 783,171**
**Int. Cl.[4] A61M 5/00**
**U.S. Cl. 604—208** **9 Claims**



1. A manually operated hypodermic syringe for extracting, retaining, and dispensing preselected dosages of fluid through a needle during injections comprising:

a. a barrel means for retaining fluid adapted at one end to allow the passage of fluid;

b. manually operable plunger means adapted to fit within the barrel means to control fluid in the barrel; and

c. stop means coacting between the barrel and the plunger which may be biased in one direction to extract certain preselected quantities of fluid without visual monitoring and biased in the opposite direction to extract different quantities of fluid.

wherein said stop means comprises a portion of the barrel having an elongated opening with a plurality of wider portions in which each wider portion is successively staggered on opposite sides of the elongated opening along its

length and each wider portion of the opening forms a stop shoulder on the barrel means.

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**4,610,669**

## PREFILLED AMPOULE-SYRINGE OF UNITARY DOSE

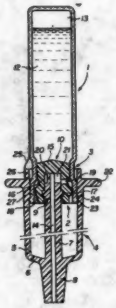
**Gabriel Meyer, and Ernst Howald, both of Vesenaz, Switzerland, assignors to Meditec S.A., Luxembourg, Luxembourg**

**Filed Jan. 15, 1985, Ser. No. 691,755**

**Claims priority, application Switzerland, Jan. 25, 1984, 344/84**

**Int. Cl.[4] A61M *5/315***

**U.S. Cl. 604—218** **10 Claims**



**1.** A prefilled ampoule-syringe of unitary dose comprising an ampoule open at one of its ends and having a narrowed zone near said end, stopper means of elastomeric material engaged within the ampoule and axially movable between a storage position and a working position, the stopper means having an interior conduit provided for bringing into communication a needle holding tip and the interior of the ampoule when the stopper means is in its working position, the interior conduit comprising an axial channel and a radial channel connected to the axial channel, the stopper means being secured to a capsule arranged around the zone of the open end of the ampoule, said stopper means comprising a stopper head which is prolonged by a flexible hollow cylindrical member which covers a central stiffening tip connecting the stopper means and the capsule, said hollow cylindrical member including said radial channel and at least one peripheral rim provided downstream from the radial channel, wherein the peripheral rim provided downstream from the radial channel is disposed below said narrowed zone of the ampoule when the stopper means is in said storage position, so that it is subjected to only a weak compression during storage.

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**4,610,670**

## STERILE CONNECTION PROCESS, APPARATUS AND SYSTEM

**Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 503,657, Jun. 13, 1983, abandoned. This application Apr. 12, 1984, Ser. No. 599,324**

**Int. Cl.[4] A61M *1/00***

**U.S. Cl. 604—29** **40 Claims**

**1.** A process for joining thermoplastic closed-end tubes together transversely of the axis of each tube comprising

(a) flattening a section of each tube to urge inside walls of each tube into contact,

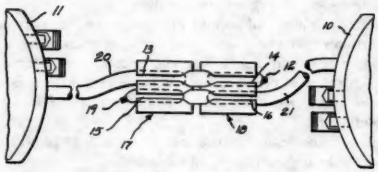
(b) urging a hot cutting means through the flattened section of each tube thereby temporarily sealing together the inside walls of each tube and providing molten tube ends,

(c) aligning the tubes to be connected with each other,

(d) joining the desired molten ends of said tubes together to form a joint between said tubes for each pair of tube ends to be connected, and

(e) cooling each joint and then applying stress to each joint to open the temporary seal in each tube, thereby providing fluid communication between the joined tubes.

**13.** An apparatus for forming a sterile connection between thermoplastic tubes comprising a cutting means, means adapted to heat said cutting means, a pair of mounting blocks adapted to receive, hold and flatten the tubes to be joined, means to provide movement between said blocks and said



cutting means to a position such that the cutting means is between said blocks and traversing where the blocks are adapted to receive said tubes, means adapted to realign said blocks to a position where two different tube ends are aligned with and facing each other for each pair of tubes to be joined, means to separate said blocks and said cutting means, and means for urging said mounting blocks together.

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**4,610,671**

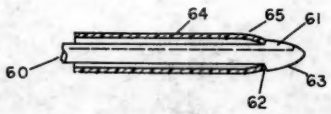
## ASSEMBLY OF STYLET AND CATHETER

**Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Santa Ana, Calif.**

**Filed Mar. 28, 1985, Ser. No. 717,159**

**Int. Cl.[4] A61M *5/18***

**U.S. Cl. 604—168** **14 Claims**



**1.** An assembly for piercing a vein, artery, organ, and the like, comprising:

a. a stylet defining an outer surface, distal end, proximal end, and a central longitudinal axis;

b. a puncture tip formed at the proximal end of the stylet;

c. a circumferential shoulder defined near the proximal end, and adjacent the puncture tip; and,

d. a catheter comprising a hydrophilic polymer disposed over the stylet, the catheter defining an outer surface, a distal end, and a proximal end in contact with the shoulder of the stylet, and forming a continuous interface at the shoulder and outer surface of the stylet, thereby enabling the catheter to enter a puncture site without blockage at the proximal end, and upon contact with liquid in the puncture site, the catheter will expand and thus enable the stylet to be withdrawn, leaving the catheter in place in the puncture site.

**10.** A method of inserting an assembly of an over-the-stylet catheter into a puncture site in a vein, artery or the like, without coring, comprising:

A. inserting the assembly into the puncture site, the assembly comprising:

a. a stylet defining an outer surface, distal end, proximal end, and a central longitudinal axis;

b. a puncture tip formed at the proximal end of the stylet;

c. a circumferential shoulder defined near the proximal end, and adjacent the puncture tip; and,

d. a catheter comprising a hydrophilic polymer disposed

over the stylet, the catheter defining an outer surface, a distal end, and a proximal end in contact with the shoulder of the stylet, and forming a continuous interface at the shoulder and outer surface of the stylet, thereby enabling the catheter to enter the puncture site without blockage at the proximal end;

B. contacting liquid in the puncture site with the assembly, the catheter being adapted to expand away from the stylet upon contact with the liquid; and,

C. withdrawing the stylet, leaving the catheter in place in the puncture site.

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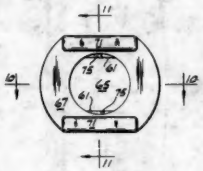
## 4,610,672
## SYRINGE LOCKING DEVICE

**Paul R. Ewalt, St. Charles; Harold G. Leigh, and Richard W. Gilson, both of St. Louis, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.**

**Filed Jun. 10, 1985, Ser. No. 743,127**
**Int. Cl.[4] A61M 5/315**
**U.S. Cl. 604—220** **15 Claims**



1. A locking device for attachment to the exterior of a syringe barrel, comprising:

a generally flat body;

means adapted to fit exteriorly of the syringe barrel for holding the device against rotation when in use on a syringe barrel;

a generally circular opening in the body for passage of a syringe plunger reciprocatably therethrough; and

at least two ridges extending chordally across the generally circular opening, said ridges being spaced from each other a distance less than the diameter of the generally circular opening and said ridges having a thickness that is less than the thickness of the body.

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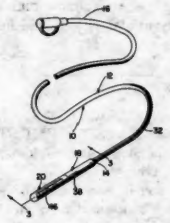
## 4,610,673
## GASTROENTERIC FEEDING TUBE

**Ronald D. Russo, Barrington, R.I., assignor to Superior Healthcare Group, Inc., Cumberland, R.I.**

**Filed Feb. 19, 1985, Ser. No. 703,319**
**Int. Cl.[4] A61M 31/005**
**U.S. Cl. 604—270** **6 Claims**



1. A gastroenteric feeding tube comprising an elongated tubular shaft having distal and proximal ends and having a longitudinally extending lumen therethrough, an enlarged intermediate portion which extends from the distal end of said shaft, and a weighted bolus which extends from said intermediate portion, said intermediate portion having at least one side aperture therein which communicates with said shaft lumen, said bolus being sufficiently flexible to permit the passage thereof through a nostril of a patient during the installation of said tube in said patient, said shaft having an imperforate side wall, said shaft having a sectional dimension of between 0.080 and 0.160 inches, and a wall thickness of between 0.015 and 0.035 inches, said lumen having a sectional dimension of at least 0.05 inches, said shaft being made of a material having an A Durometer Scale hardness of between 60 and 100, said intermediate portion being at least as rigid as said shaft, whereby said shaft and said intermediate portion are sufficiently flexible to permit the passage thereof through said nostril during the installation of said tube in said patient, but nevertheless sufficiently rigid to permit the installation of said tube in said patient without the use of a stylet.

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## 4,610,674
## CATHETER INTRODUCING INSTRUMENT

**Tatsuo Suzuki, Machida, and Atsushi Matsumoto, Fuji, both of Japan, assignors to Terumo Kabushi Kaisha, Tokyo, Japan**

**Filed Aug. 29, 1985, Ser. No. 770,720**
**Claims priority, application Japan, Sep. 13, 1984, 59-190487**
**Int. Cl.[4] A61M 25/00, 5/00**
**U.S. Cl. 604—282** **15 Claims**

1. A catheter introducer, comprising:

a hollow sheath extending continuously from a base end portion thereof to a distal end portion thereof;

a hollow hub having an opening in a connection portion into which said base end portion of said sheath is received, said opening defining an annular space between an inner surface portion of said hub and an outer surface portion of said sheath;

a coil body mounted in said connection portion of said hub, said coil body extending axially of said sheath from the connection portion to a portion of said sheath in the proximity of the connection portion; and

fixing means for fixing said base end portion of said sheath, which is received in said connection portion, to said hub, said coil body having an end portion on the side of said hub which is situated between the inner surface portion of said hub and the outer surface portion of said sheath.

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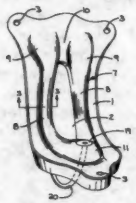
## 4,610,675
## DEVICE FOR COLLECTING FLUID DISCHARGED FROM FEMALE ORGANS

**David Triunfol, 2001 N. 72 Ct., Elmwood Park, Ill. 60635**

**Continuation of Ser. No. 529,524, Sep. 6, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 756,554**
**Int. Cl.[4] A61F 5/44**
**U.S. Cl. 604—329** **7 Claims**

1. A device for collecting fluids from a female patient's genitals, comprising a flexible pad having a generally flat contour prior to application to the urogenital area of a female body and when applied to the external portions of the urogenital area assuming a curvlinear shape, said pad having a longitudinal central opening and having an inner surface to be in contact with said external portions and having an outer surface, said pad further having a pair of longitudinal extending side ridge means on said inner surface straddling the opening for exerting pressure on the external portion of the urogenital area bordering the labia majora to urge and hold the labia majora in an open condition, corresponding ends of said ridge means being laterally spaced and non-connecting and together with said

inner surface forming an open gap to receive the clitoris, and opposite ends of the ridge means being connected together at an upraised junction means forming a perineal ridge disposed



to engage the navicular fossa, and collecting means connected to the outer surface of the pad for collecting fluid discharged into said opening from the female genitals.

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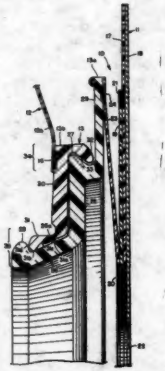
**4,610,676**

## OSTOMY APPLIANCE COUPLING RING CONSTRUCTION

**Barry L. Schneider, Deerfield; Marvin E. Jensen, Niles, and Mahmood Mohiuddin, Lake Zurich, all of Ill., assignors to Hollister Incorporated, Libertyville, Ill.**

**Filed May 17, 1984, Ser. No. 611,423**
**Int. Cl.[4] A61F *5/44***
**U.S. Cl. 604—339** **21 Claims**



1. A coupling for detachably connecting an ostomy faceplate to an ostomy pouch, said coupling including first and second coupling rings formed of flexible thermoplastic material; said first coupling ring having an annular body portion merging along its inner perimeter with a tubular neck portion extending axially away from said body portion; said neck portion having an outer sealing surface and having a free end terminating in an annular and radially-outwardly projecting rim; said second ring also having an annular body portion and having an inner collar portion detachably receiving said neck portion, with said collar portion extending axially away from the body portion of said second ring in generally the same direction as said neck portion and with the inside of said collar portion sealingly engaging the outer surface of said neck portion; wherein the improvement comprises

said annular body portion of said first ring being generally planar and defining an annular latching shoulder extending about the outer perimeter thereof; said body portion of said second ring also being generally planar and having an annular latching rib extending about the outer periphery thereof in a generally axial direction opposite from the direction of said collar portion; said latching rib, along with the remainder of said body portion of said second ring, defining a latching recess detachably receiving and retaining the shoulder of said first ring.

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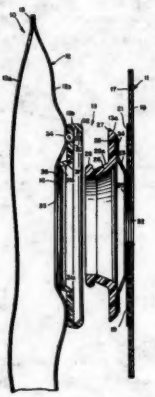
**4,610,677**

## EXTENDED FILM SEAL FOR OSTOMY APPLIANCE

**Mahmood Mohiuddin, Lake Zurich, Ill., assignor to Hollister Incorporated, Libertyville, Ill.**

**Filed Sep. 24, 1985, Ser. No. 779,628**
**Int. Cl.[4] A61F *5/44***
**U.S. Cl. 604—339** **24 Claims**



1. An ostomy appliance comprising a collection pouch formed of flexible plastic film and including a side wall having an opening therethrough; a pouch coupling ring having an opening and being externally secured to said pouch about said side wall opening; a faceplate to be adhesively and peristomally secured to a patient; a faceplate coupling ring having an opening and being mounted upon said faceplate; means provided by said rings for detachably latching the same together; one of said rings having a neck portion with a smooth continuous annular rim projecting through the opening of the other of said rings when said rings are latched together; and an annular web secured to a surface of said other ring facing away from said one ring and defining an opening concentric with and smaller than the opening of said other ring; said annular web being formed of flexible, stretchable plastic material and sealingly engaging said annular rim of said neck when said rings are latched together.

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**4,610,678**

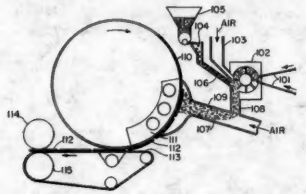
## HIGH-DENSITY ABSORBENT STRUCTURES

**Paul T. Weisman, and Stephen A. Goldman, both of P.O. Box 39175, Cincinnati, Ohio 45247**

**Continuation-in-part of Ser. No. 507,824, Jun. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 437,846, Mar. 10, 1983, abandoned. This application Sep. 6, 1983, Ser. No. 529,900**
**Int. Cl.[4] A61F *13/16***
**U.S. Cl. 604—368** **33 Claims**

1. A flexible, substantially unbonded, absorbent structure comprising an air-laid, substantially dry mixture of hydrophilic fibers and discrete particles of a water-insoluble, cross-linked polymeric hydrogel, in a fiber/hydrogel weight ratio from

about 30:70 to about 98:2; said absorbent structure having a density of from about 0.15 to about 1 g/cm$^3$, a moisture content of less than about 10% by weight of the dry absorbent structure and a Gurley Stiffness value of less than 2 grams.

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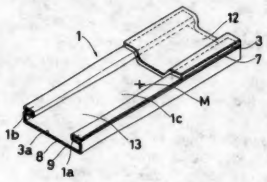
**4,610,679**

**BEDSORE-FREE DIAPER**

**Masao Matsushita, 1-11-8 Kohama Nishi, Sumínoe-ku, Osaka, Japan**

**Filed Oct. 2, 1985, Ser. No. 782,862**
**Claims priority, application Japan, Mar. 15, 1985, 5037669[U]**
**Int. Cl.$^4$ A61F *13/16***
**U.S. Cl. 604—369** **8 Claims**




1. A bedsore-free diaper characterized in that, a diaper formed of water absorbent sheets laid in lyers, said bedsore-free diaper comprises:

folded portions for preventing lateral leakage of human waste out of the diaper, said folded portions being disposed at both sides of said diaper with said folded portions directed upwardly;

a water absorbent cushion mat including a plurality of pneumatically distended portions, said portions being provided independently of each other inside said diaper in such a manner that said distended portions face the side in contact with the human body so as to correspond with the lumbosacral region of the human body inside said diaper; and

a guide mark provided inside said diaper on substantially a center line in the longitudinal direction of said diaper at specified interval from said cushion mat, said mark being intended to provide an indication mark by which the user can precisely apply said cushion mat to the lumbosacral region.

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**4,610,680**

**DISPOSABLE TRAINING PANTY**

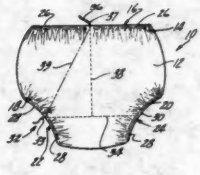
**Ruby S. LaFleur, 10490 W. Outer Dr., Detroit, Mich. 48223**

**Filed Apr. 29, 1985, Ser. No. 728,109**
**Int. Cl.$^4$ A61F *13/16***
**U.S. Cl. 604—385 A** **17 Claims**

1. A training panty comprising:

a panty member having a waist band defining a waist opening and two leg bands defining two spaced apart leg openings separated by an intermediate portion of said member, said panty member being formed with an outer layer of material substantially impervious to water, and an inner layer of water absorbant material, and

means for selectively splitting said member, said waist band and both said leg bands, said means including means for bifurcating the intermediate portion of said member along a first line extending from one leg opening to the other leg opening and means for bifurcating said panty member along a second line extending inclusively from said waist band to one of said first line and said leg opening.



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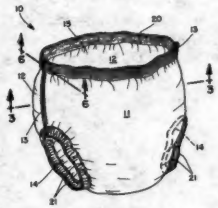
**4,610,681**

**DISPOSABLE UNDERPANTS HAVING DISCRETE OUTER SEALS**

**David T. Strohbeen, Outagamie County, and John I. Van-Deurzen, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed May 31, 1985, Ser. No. 740,135**
**Int. Cl.$^4$ A61F *13/16***
**U.S. Cl. 604—396** **23 Claims**



1. A disposable garment comprising a multilayer web and at least one sealed exterior seam formed by bringing the inner surfaces of multilayer webs at their respective edges into contact such that the resulting seam extends outwardly from the garment and wherein said at least one seam is sealed with at least two narrow lines, the total seam is less than about 3/16" wide.

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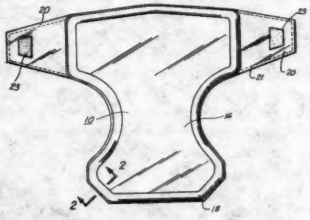
**4,610,682**

**DISPOSABLE DIAPER**

**Yvette B. Kopp, 6712 Villere St., Arabi, La. 70032**

**Filed Jul. 25, 1985, Ser. No. 758,691**
**Int. Cl.$^4$ A61F *13/16***
**U.S. Cl. 604—385 R** **1 Claim**



1. An improved disposable diaper comprising:

(a) inner and outer facings respectively fluid permeable and

impermeable cut on a bias from said materials for longitudinal and transverse stretchability, and with reduced width intermediate oppositely disposed ends for lessening diaper bulk between legs and around waist of wearer, one said outer facing end being transversely extended outwardly in opposite directions for fastening flaps;

(b) absorbent filler sandwiched between said facings for absorbing fluid through said liquid permeable facing;

(c) a belt of said absorbent filter wrapped in a bias cut strip of said permeable facing the length of a permeable facing periphery for fixing in a bias cut welted edge closing said facings against leakage therethrough and thereunder; and

(d) fastening flaps extending transversely from an end of said impermeable facing for stretch folding forwardly around and over an opposite diaper end upwardly folded between the legs of said wearer with no overlapping of absorbent filler parts.

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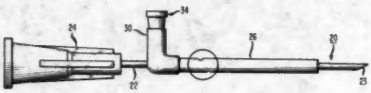
**4,610,683**

## SUCTION NEEDLE

**Vincent L. Vaillancourt, Livingston, N.J., assignor to MANRESA, Inc., Hillsdale, N.J.**

**Filed Jul. 17, 1985, Ser. No. 755,838**
**Int. Cl.[4] A61B *19/00***
**U.S. Cl. 604—405** **20 Claims**



**12.** A suction needle device for fluid withdrawl and venting the interior of a stoppered vial or container, said device including:

(a) a hollow needle having a distal shank portion;

(b) a housing having first and second open ends and a wall protion therebetween, said housing being adapted to receive said shank portion and to provide a connection between said shank and said wall portion, said housing being disposed so that a shank portion so received will extend from said wall portion through said second end;

(c) a thin-walled tubular sleeve mounted in and secured to said second housing end so as to extend outwardly therefrom, said sleeve having a length less than that of said shank portion and having an internal diameter larger than the outer diameter of said shank portion, said sleeve being coaxially aligned with the portion of the shank that extends through the second housing end so as to provide a substantially annular spacer therebetween;

(d) an air passageway within the housing and in flow communiction with the annular space and the first housing end, the first end of the housing being provided with means for filtering air that passes between the air passageway and the atmosphere; and

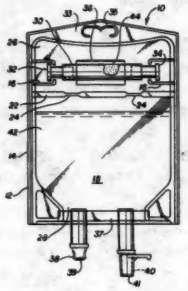
(e) at least two localized crimps formed in said tubular sleeve, the crimps being longitudinally displaced and being only sufficient to locally deform the sleeve without substantially deforming the lumen of the shank portion disposed therethrough.

**4,610,684**

## FLEXIBLE CONTAINER AND MIXING SYSTEM FOR STORING AND PREPARING I.V. FLUIDS

**Kenneth H. Knox, Vernon Hills, and Mark E. Larkin, Lindenhurst, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed Jun. 22, 1984, Ser. No. 623,065**
**Int. Cl.[4] A61B *19/00***
**U.S. Cl. 604—416** **17 Claims**



**1.** A device for separately storing and subsequently mixing a fluid and a medicament comprising:

a flexible sealed container having at least one port;

partition means for dividing said flexible container, said partition means spanning the interior of said flexible container to define first and second compartments within said flexible container, said partition means having at least one weakened section for providing communication between said first and second compartments upon severing of the weakened section;

said first compartment being sealed for storing the fluid therein and being in fluid communication with said port;

a vial having a medicament therein and having at least one opening and a removable barrier closing said opening, said vial disposed within said second compartment;

whereby mixing of the fluid and the medicament is accomplished by manipulation of said second compartment of said flexible container to remove said removable barrier from said vial and by manipulation of the walls of the flexible container to cause severing of the weakened section of said partition means, allowing the fluid to commingle with the medicament.

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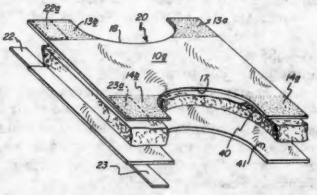
**4,610,685**

## FIBROUS WEB WITH REINFORCED MARGINAL PORTIONS, METHOD FOR MAKING THE SAME AND ABSORBENT ARTICLE INCORPORATING THE SAME

**John M. Raley, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Sep. 9, 1985, Ser. No. 774,111**
**Int. Cl.[4] A61F *13/16***
**U.S. Cl. 604—366** **18 Claims**



**1.** A fibrous web with reinforced marginal portions and an

unreinforced medial portion, wherein the reinforced marginal portions are comprised of fibers which are bonded one to the other more strongly than those of the medial portion, and wherein said stronger bonding provides said reinforcement substantially without coupling said fibrous web to another object.

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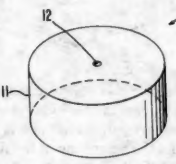
**4,610,686**

## CONTROLLED DELIVERY OF HALOPERIDOL BY AN OSMOTIC DELIVERY SYSTEM

**Atul Ayer, Mountain View; Felix Theeuwes, Los Altos, and Patrick S. L. Wong, Hayward, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.**

**Filed Nov. 2, 1983, Ser. No. 547,789**
**Int. Cl.[4] A61M *7/00***
**U.S. Cl. 604—890** **15 Claims**




1. An osmotic system for the controlled delivery of haloperidol to an environment of use comprising:

(a) a wall a semipermeable composition permeable to the passage of an exterior fluid, and substantially impermeable to the passage of haloperidol, the wall surrounding and forming:

(b) a compartment comprising a dosage unit amount of haloperidol and an effective amount of citric acid for increasing the solubility of haloperidol thereby enhancing the delivery of haloperidol; and,

(c) at least one passageway through the wall communicating the exterior of the system with the interior of the system for delivering haloperidol at a controlled rate over time.

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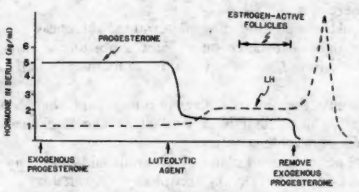
**4,610,687**

## METHOD FOR BREEDING CONTROL IN FEMALE BOVINES

**Ralph L. Fogwell, Bath, Mich., assignor to Board of Trustees Operating Michigan State University, East Lansing, Mich.**

**Filed Aug. 6, 1984, Ser. No. 638,044**
**Int. Cl.[4] A61K *9/22, 31/557***
**U.S. Cl. 604—891** **10 Claims**




Hormonal profiles resulting from method proposed to precisely regulate ovulation in cattle.

1. A method for fertile breeding control in female bovines comprising:

(a) establishing an estrus and ovulation blocking period of several days by continuous administrating of a progestin using an implant which slowly releases the progestin into the blood stream;

(b) injecting a luteolytic agent while continuing the administration of the progestin for a period of 1 to 6 days; and

(c) terminating the administration of the progestin, thereby allowing estrus and ovulation to occur in a shorter time period and in a relatively narrower time span than if administration of the progestin was terminated at the time of injection of the luteolytic agent.

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**4,610,688**

## TRIAXIALLY-BRAIDED FABRIC PROSTHESIS

**Thomas A. Silvestrini, East Lyme, and Joseph E. Laptewicz, Jr., Groton, both of Conn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.**

**Filed Apr. 4, 1983, Ser. No. 481,612**
**Int. Cl.[4] A61F *2/06, 2/24***
**U.S. Cl. 623—1** **14 Claims**

1. A prosthesis for use in repairing or replacing ligament or tendon tissue, said prosthesis having first and second opposed end portions adapted to be attached with the prosthesis in tension to the body of a patient, with said two end portions defining between them the longitudinal direction of the prosthesis, and said prosthesis comprising a triaxially-braided fabric element containing interwoven first, second and third sets of fibers, with the fibers of said first set being elastic and oriented in substantially said longitudinal direction of the prosthesis, the fibers of said second and third sets being oriented at substantially the same acute braiding angle with respect to the fibers of said first set, the fibers of said first set having greater elasticity than the fibers of both of said second and third sets, the fibers of said second and third sets having greater yield strength and Young's modulus than the fibers of said first set, and said prosthesis exhibiting a tensile break point of at least about 75 kg.

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**4,610,689**

## INTRAOCULAR LENS

**John M. Graether, 611 Elmwood, Marshalltown, Iowa 50158**

**Filed Jul. 29, 1983, Ser. No. 518,370**
**Int. Cl.[4] A61F *2/16***
**U.S. Cl. 623—6** **1 Claim**

1. In a surgically replacement intraocular lens, comprising:

a lens body having an outer periphery;

a pair of compresible, resilient symmetrical loop members secured to the periphery of said lens body and being symmetrically positioned opposite each other with respect to the center of the lens body;

each loop member being comprised of a continuous strand of material having opposite parallel widely spaced terminal ends secured to said lens body, and extending outwardly in a closed loop to a distal end portion and dwelling in a position spaced from and substantially parallel to the periphery of the lens body;

the lateral width of said loop member being the greatest at the points where said terminal ends are secured to said lens body, and continually narrowing between said lens body and said distal end portion;

each terminal end of one of said loop members being in planar alignment with one each of the terminal ends of the other of said loop members,

said distal end portion being curved inwardly in a direction towards said lens body to provide a reversed curve portion;

said continuous strand of material comprising an inner curved portion spaced from an outer curved portion with said distal end portion therebetween;

said distal end portion defining a generally circular space communicating with the space between said inner and outer curved portions and having a diameter greater than the distance between said inner curved portion and said outer curved portion immediately adjacent said distal end portion.

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**4,610,690**

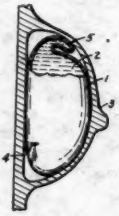
**RUPTURE RESISTANT PROSTHESIS WITH BONDED SURFACE LAYER AND METHOD OF FORMING SAME**

**John S. Tiffany, Ventura, Calif., assignor to Mentor Corporation, Minneapolis, Minn.**

**Filed Feb. 22, 1983, Ser. No. 468,249**

**Int. Cl.[4] A61F *2/12***

**U.S. Cl. 623—8** **25 Claims**




1. A surgically implantable rupture-resistant breast prosthesis comprising:

a flexible, creasable shell of silicone polymer adapted to contain a saline inflating liquid and having a wall with inner and outer surfaces; and

an abrasion resistant hydrogel layer having substantially greater lubricity than the shell bonded to one of such wall surfaces to substantially reduce self-abrasion damage to the shell wall during sliding contact between opposing areas of this one surface when a saline inflating liquid is confined within the shell and the shell wall has a crease after surgical implantation.

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**4,610,691**

**VOICE PROSTHESIS DEVICE**

**William A. Depel, Lowell; Bernd Weinberg, and Jerald B. Moon, both of West Lafayette, all of Ind., assignors to Purdue Research Foundation, W. Lafayette and Bivona Surgical Instruments, Inc., Gary, both of, Ind.**

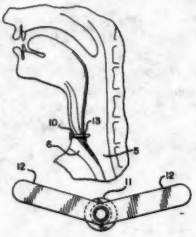
**Filed Jun. 30, 1983, Ser. No. 509,963**

**Int. Cl.[4] A61F *2/20***

**U.S. Cl. 623—9** **4 Claims**

1. In a voice prosthesis device to be worn in a fistula communicating between the trachea and esophagus of the wearer and including a housing having an air inlet port opening into the trachea and having an air outlet port opening into the esophagus, and a one-way check valve including a valve seat within said housing and a membrane-like disc anchored adjacent its periphery to said housing so as to close against said valve seat and prevent flow of esophageal contents from the esophagus into the trachea, the improvement, comprising:

said disc including one-piece attachment means which is smaller than the disc and extends outwardly beyond the




periphery of said disc and aperture means dimensioned to receive the attachment means whereby the disc is effectively hinged primarily through the attachment means at a point spaced from the periphery of the disc so that the disc remains substantially flat in response to the opening of the disc by pivotally moving away from said valve seat.

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**4,610,692**

**IMPLANT FOR FILLING BONE CAVITIES AND FIXING BONE FRAGMENTS IN A LIVING BODY, METHOD OF PRODUCING THE SAME, AND BONE IMPLANT SYSTEM**

**Jürgen Eitenmuller, Brauweiler; Helmut Rackur, Remchingen/-Singen; Walter Wimmer, and Marija Weiss, both of Limburg-/Lahn, all of Fed. Rep. of Germany, assignors to Mundipharma GmbH, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 350,341, Feb. 19, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 623,364**

**Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106445; Jul. 3, 1981, 3126273; Aug. 20, 1981, 3133015; Aug. 20, 1981, 3133016**

**Int. Cl.[4] A01N *25/26***

**U.S. Cl. 623—16** **33 Claims**

17. A sintered tricalcium phosphate implant for filling bone cavities and for fixing bone fragments in a living body, comprising

a discretely-shaped, baked porous body of tricalcium phosphate,

at least one therapeutically-active ingredient impregnated into said porous body and distributed among the pores therein, and

at least one coating of predetermined thickness of a biodegradable substance on at least a portion of said porous body impregnated with said therapeutically-active ingredient,

whereby the time of absorption of said therapeutically-active ingredient is controlled by the thickness of said biodegradable substance.

18. The implant of claim 17 wherein said discretely-shaped porous body of tricalcium phosphate, is formed by

mixing the same with at least one substance which under heat sufficiently high to bake said tricalcium phosphate, forms a gas; and

baking said shaped body at a temperature sufficiently high to cause gas formation from said substance, thereby forming a discretely-shaped, porous body of tricalcium phosphate.

22. The implant of claim 17, in which said therapeutically-active ingredient is selected from the group consisting of polyvinyl pyrrolidone iodine, penicillin, cycloserin, bacitracin, nystatin, amphotericin, gentamycin, novobiocin, erythromycin, momycin, streptomycin, flucloxacillin, sulfonamide and mixtures thereof.

23. The implant of claim 17, in which said biodegradable substance is selected from at least one of polymethacrylate, polylactide, and polydextran.

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**4,610,693**

## IMPLANTING ARTICLE MOLDED BY CENTRIFUGAL DISPERSION AND THE METHOD FOR PRODUCING THE SAME

**Shigeo Niwa, Aichi; Junji Sugishita, Kuwana, and Masami Ishii, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Apr. 9, 1984, Ser. No. 598,020**

**Claims priority, application Japan, Apr. 8, 1983, 58-62795**

**Int. Cl.[4] A61F** *2/02, 2/28, 2/32*

**U.S. Cl. 623—16** **12 Claims**

1. An implanting article to be implanted into a live body, comprising:

a centrifugally cast base body including

a surface portion which covers at least a portion of said base body

wherein said base body includes a central portion composed mainly of a mother material suitable for implant use and

wherein said surface portion comprises a surface layer portion containing dispersed apatite particles.

10. A method for producing an implanting article, which comprises;

placing a mixture of mother material suitable for implant use and apatite particles having a different and greater specific gravity than that of said mother material into a mold,

melting the mother material of said mixture;

rotating said mold to apply a centrifugal force with a gravity force factor of 5G to 3000G to said mixture,

solidifying said mixture under the application of said centrifugal force and

removing a resulting solidified article out of said mold.

4,610,694

## MATCH

Kurt Krusche, Nansenring 22, 6000 Frankfurt/Main, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,145
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441773
Int. Cl.[4] C06F *3/00, 5/00*
U.S. Cl. 44—42 9 Claims

1. A match comprising a match splint with a match head formed thereon, said head comprising:

an outer second layer of igniting composition to provide heat to an inner first layer upon ignition of said outer second layer; and

said inner first layer comprising an adsorbent with a scent compound therein, and a binder means for encapsulating said adsorbent with scent compound, said binder means having a property of gradual breakdown in order to gradually release a scent of said scent compound from said first layer only upon being heated by ignition of said outer second layer.

4. A match according to claim 1 characterised in that the adsorbent is at least one of kieselguhr, silica gel and active carbon.

5. A match according to claim 1, characterised in that the binder is a plastic dispersible in water.

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4,610,695

## FLUID FUEL MIXTURE BASED ON A PULVERIZED SOLID FUEL, PETROLEUM RESIDUES AND WATER, PROCESS FOR ITS PREPARATION, AND THE USE IN BOILERS AND INDUSTRIAL FURNACES

Pierre Crespin, Paris; Francois Guay; Paul H. Galvin, both of Le Havre, and Jean-Paul Gouzard, Malmaison, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Continuation of Ser. No. 565,962, Dec. 27, 1983, abandoned.
This application Mar. 3, 1986, Ser. No. 837,327
Claims priority, application France, Dec. 27, 1982, 82 21822
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 20 Claims

1. A pumpable fluid fuel mixture, consisting essentially of a suspension of (a) from 70 to 5 weight percent of a pulverized solid fuel of particle size such that 80 percent of the particles are less than 80 microns, wherein said solid fuel is selected from the group consisting of natural coal, de-ashed coal, coal-washery sludge and solid petroleum-based fuel, (b) from 5 to 70 weight percent of a pulverized petroleum residue of particle size up to 120 microns, wherein said petroleum residue is selected from the group consisting of asphaltenes, pitches from hydrocracking and catalytic cracking, residues of combustion, distillation, gasification or pyrolysis, pitches from deasphalting, and oxidized asphalts, and (c) from 15 to 40 weight percent of an aqueous phase such that the suspension has a solid proportion of from 60 to 85 weight percent.

4,610,696

## PROCESS FOR THE FORMATION OF HOMOGENEOUS FUEL COMPOSITIONS CONTAINING A PETROLEUM CUT AND AT LEAST ONE SHORT CHAIN ALIPHATIC ALCOHOL AND COMPOSITIONS THEREBY OBTAINED

Christian Bernasconi, Vernaison; Michel Llinares, Saint Genis Laval, and Robert Nouguier, Plan de Cuques, all of France, assignors to Elf France, Paris, France

Filed Jul. 1, 1985, Ser. No. 750,548
Claims priority, application France, Jul. 3, 1984, 84 10545
Int. Cl.[4] C10L *1/02*
U.S. Cl. 44—56 8 Claims

1. Process for maintaining homogeneous fuels comprising an automobile fuel and at least one short-chain aliphatic alcohol through dilution with an additive, wherein the additive is a glycerol monoether having one of the general formulae:

(I)

(II)

in which R represents a $C_6$ to $C_{24}$ linear or branched aliphatic radical and wherein the additive is used in quantities of between 0.5 and 15 $kgm^3$ of fuel.

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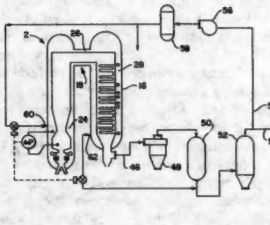
4,610,697

## COAL GASIFICATION SYSTEM WITH PRODUCT GAS RECYCLE TO PRESSURE CONTAINMENT CHAMBER

Scott L. Darling; Michael C. Tanca, both of Tariffville, and Paul R. Thibeault, Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 19, 1984, Ser. No. 683,460
Int. Cl.[4] C10J *3/68*
U.S. Cl. 48—77 4 Claims



1. A pressurized coal gasification system, comprising:

a vertically oriented, elongated gasifier vessel having an inner, water-cooled chamber for containing a high temperature fuel gas producing reaction, and an outer, pressure resistant chamber;

a vertically oriented, elongated heat exchange vessel having an inner, water-cooled chamber containing means for cooling the fuel gas produced in the gasification vessel and an outer, pressure resistant chamber;

a horizontally oriented cross-over conduit disposed between the gasifier vessel and the heat exchange vessel, the cross-over conduit having an inner, water-cooled transfer duct for conveying the hot product fuel gas from the inner gasification vessel to the inner heat exchange vessel, and an outer, pressure resistant duct sealingly engaged at opposite ends to the pressure resistant gasification chamber and the pressure resistant heat exchange chamber;

the gasification vessel, the cross-over conduit, and the heat exchange vessel each having an annular volume therein formed between the respective pressure resistant members and water-cooled members, the respective annular volumes forming a single, contiguous annular gas flow volume, said annular gas flow volume being distinct from the hot product gas flow within the respective water-cooled members;

means for removing entrained particulate matter from the cooled product fuel gas emerging from the heat exchange means;

means for controllably introducing at least a portion of the particulate free product fuel gas from the removal means into the said annular gas flow volume for flow therethrough; and

means for returning said portion of product gas to the cooled product fuel gas at a location downstream of said gasifier vessel with respect to said product fuel gas flow, from said annular gas flow volume.

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**4,610,698**

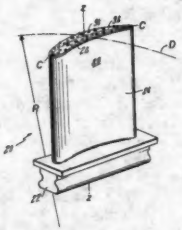
## ABRASIVE SURFACE COATING PROCESS FOR SUPERALLOYS

**Harry E. Eaton, Woodstock; Richard C. Novak, Glastonbury, and Alfred P. Matarese, North Haven, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Jun. 25, 1984, Ser. No. 624,446**

**Int. Cl.[4] B24D** *11/02*

**U.S. Cl. 51—295** **15 Claims**



1. The method of providing an abrasive material comprised of particulates and matrix on the surface of an article characterized by adhering a single layer of spaced apart ceramic particulates having a metal cladding to the article surface; causing the metal cladding to adhere to the surface so that the particulates are thereby adhered to the article and project from the surface in spaced apart fashion; depositing on the surface a layer of metal to fill the spaces between the particulates with matrix material which inherently has voids; heating the article to an elevated temperature to densify the matrix and to metallurgically bond the matrix to the metal clad particulates and the substrate; and machining the surface of the abrasive material to a finish surface so that the particulates are visible at the surface.

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**4,610,699**

## HARD DIAMOND SINTERED BODY AND THE METHOD FOR PRODUCING THE SAME

**Shuji Yazu, and Tsutomu Nakamura, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

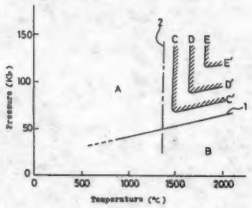
**Filed Jan. 3, 1985, Ser. No. 688,654**

**Claims priority, application Japan, Jan. 18, 1984, 59-7737; Jul. 5, 1984, 59-140119; Jul. 5, 1984, 59-140120; Jul. 25, 1984, 59-155940; Oct. 25, 1984, 59-224496**

**Int. Cl.[4] B24D** *3/02*

**U.S. Cl. 51—309** **4 Claims**

1. A hard diamond sintered body, wherein diamond particles are mutually bonded, obtained by graphitizing a part or whole of a synthetic diamond powder comprising Group VIII iron group metals of the Periodic Table or metals selected from Cr, Mn and Ta present in an amount of 0.01 to 10% by weight and then sintering the powder under such conditions that the diamond is stable, said sintered body containing intermetallic compounds consisting of at least one material selected from




said iron group metals of Cr, Mn and Ta or alloys thereof and/or said metals or alloys and at least one metal selected from Ti, Zr, Hf, V, Nb, Mo, W, Cr and Ta as the remainder in an amount of 0.01 to 12% by weight.

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**4,610,700**

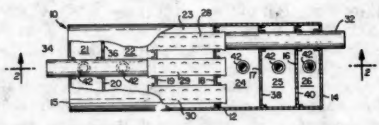
## ADSORBENT COMPOSITION USEFUL IN RETARDING CORROSION IN MUFFLERS

**William C. Miller, Katonah, N.Y.; Stephen R. Dunne, Danbury, Conn., and Joseph P. Ausikaitis, Briarcliffe Manor, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.**

**Continuation-in-part of Ser. No. 548,578, Nov. 4, 1983. This application Oct. 4, 1984, Ser. No. 657,594**

**Int. Cl.[4] B01D** *53/04*

**U.S. Cl. 55—35** **12 Claims**



1. Method for inhibiting the corrosion of metal parts of a muffler used in conjunction with an internal combustion engine which comprises maintaining in the internal space of said muffler an adsorbent mass comprising a mixture of a crystalline zeolitic aluminosilicate having the chabazite crystal structure and a zeolitic aluminosilicate having the faujasite crystal structure, said adsorbent mass being in contact with any gases entering said muffler from the internal combustion engine and the ambient atmosphere.

7. An exhaust muffler for an internal combustion engine comprising a metal casing through which exhaust gases are adapted to flow, said casing having an exhaust gas inlet and an outlet, and an adsorbent mass comprising a mixture of a crystalline aluminosilicate having the chabazite crystal structure and a zeolitic aluminosilicate having the faujasite crystal structure, said adsorbent mass being in contact with and gases entering said casing from the internal combustion engine and the ambient atmosphere.

## 4,610,701
## METHOD FOR SEPARATING GASEOUS AND LIQUID COMPONENTS FROM A FOAMY GAS LIQUID MIXTURE

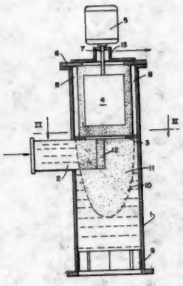
**Albert Hoffman, Wolfratshausen, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 608,963, May 10, 1984, Pat. No. 4,553,990. This application Sep. 4, 1985, Ser. No. 772,447**

**Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317260**

**Int. Cl.[4] B01D** *19/02*

**U.S. Cl. 55—87** **10 Claims**



1. A method for separating gaseous and liquid components of a foamy gas liquid mixture; comprising,

feeding the foamy gas liquid mixture tangentially through the opening into a centrifugal separator to generate a circular flow, the circular flow separating foam from liquid by centrifugal force, the separated foam collecting within a central vortex formed by the circulating liquid flow, and with increasing foam formation, rising towards an upper end of the centrifugal separator above the opening for the tangential feed,

withdrawing gas free liquid from a lower end of the centrifugal separator,

decomposing the separated foam with a turbine extending into the upper end of the centrifugal separator, the turbine breaking the foam down into liquid and gaseous components,

withdrawing the gaseous component from the upper end of the centrifugal separator, the liquid component settling into the lower end of the centrifugal separator.

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## 4,610,702
## FILTER APPARATUS FOR AIR OR GAS PURIFICATION

**Anders Krantz, Söderala, Sweden, assignor to Industriell Arbetshygien i Soderhamn AB, Sweden**

**PCT No. PCT/SE84/00172, § 371 Date Jan. 3, 1985, § 102(e) Date Jan. 3, 1985, PCT Pub. No. WO84/04467, PCT Pub. Date Nov. 22, 1984**

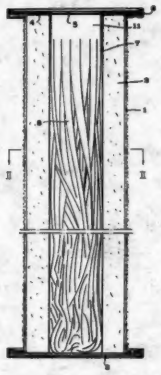
**PCT Filed May 7, 1984, Ser. No. 694,453**

**Claims priority, application Sweden, May 10, 1983, 8302657; Jul. 13, 1983, 8303959**

**Int. Cl.[4] B01D** *27/06*

**U.S. Cl. 55—155** **7 Claims**

1. A filter apparatus for purifying air or gas, comprising a tubular assembly having at least one fine filter tubular layer and at least one coarse filter tubular layer disposed within said fine filter tubular layer and defining a central cavity, a plurality of flexible strips of a fiberous material mounted in the cavity so as to be movable relative to the inner surface of said coarse filter tubular layer and so as to be set in motion by air passing through the filter apparatus such that the strips mechanically work said inner surface of said coarse filter tubular layer to counteract premature clogging thereof, said strips also comprising means for intercepting and separating contaminated constituents from the air flow so as to prefilter the air flow before it reaches the coarse filter tubular layer, the number of strips being such that the cavity confined by said coarse filter tubular layer is substantially completely filled with strips contacting each other but partially separated from each other by small irregular voids so as to form a bundle of randomly oriented strips in said cavity.



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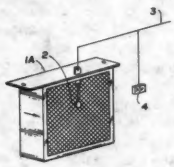
## 4,610,703
## AIR PURIFIER FOR PROTECTING MOTOR VECHICLE OCCUPANTS FROM POLLUTION

**Thaddeus Kowalczyk, 8163 Lochdale, Dearborn Heights, Mich. 48127**

**Filed Jan. 31, 1986, Ser. No. 824,610**

**Int. Cl.[4] B01D** *46/00*

**U.S. Cl. 55—274** **3 Claims**



1. An air purifier system for the passenger compartment of a passenger motor vehicle, comprising:

a plenum having an "Air Purifier" therein;

an air inlet for introducing outside air into said plenum;

vent means in said plenum for directing air from said plenum into said passenger compartment;

means coupled with said plenum for conditioning air introduced into said plenum;

means for purifying the air introduced into said plenum, said air purifier including an air filter in said plenum through which air may flow and in which dirt from said air may accumulate to clog said air filter; and

monitoring means for generating an electrical signal indicating that said filter is clogged with dirt, said monitoring means including a sensor switch having a moveable sensor plate mounted on the downstream side of and in the path of airflowing through said filter so as to be moved to a first position in which said switch is open and said signal is prevented from being generated, said monitoring means including means for biasing said sensor plate to a second position in the absence of sufficient air flow through said filter when said filter is clogged, said sensor switch gener-

ating said signal in response to the movement of said sensor plate to said second position.

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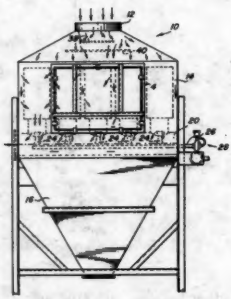
4,610,704

## DOWNFLOW DUST FILTER

Kenneth L. Richard, 514 Echo Valley Rd., Knoxville, Tenn.

Filed Nov. 14, 1985, Ser. No. 798,115
Int. Cl.[4] B01D *27/00, 46/04*
U.S. Cl. 55—302 3 Claims



1. Industrial dust filter apparatus comprising:
a housing including upper, intermediate and lower sections, said upper section having a top opening inlet for particulate laden gases and said lower section tapering downwardly to a particulate outlet;
a plurality of vertically arranged substantially cylindrical filters supported in substantially parallel relationship to each other in said intermediate section of said housing, said filters being closed at their upper ends and having their exterior filter surfaces exposed to particulate laden gases from said inlet;
at least one horizontal duct extending across said housing beneath said filters, closed at one end and opening at its other end to a clean gas outlet through a side wall of said intermediate housing section;
means communicating the lower open end of said filters through the upper walls of said duct so that said duct functions as a clean gas plenum;
a plurality of verturis, vertically supported in said duct, one aligned with each filter; and
means in said duct for pulse firing a jet of air upwardly through said venturis into the interior of said filters to remove particulates from the outer surfaces thereof.

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4,610,705

## FILTER FOR DUCTLESS RANGE HOOD

Joseph R. Sarnosky, Fort Atkinson, and David W. Wolbrink, Hartford, both of Wis., assignors to Broan Manufacturing Co. Inc., Hartford, Wis.

Filed Nov. 6, 1984, Ser. No. 668,716
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—316 23 Claims

1. A filter for a ductless range hood comprising:
a first layer providing an impact barrier for removing coarse particles such as grease spatters from cooking discharges, and resisting the heat of incoming discharges for preserving filtering capacity and service life of downstream filtering layers;
a second layer providing absorption of grease remaining in the cooking discharge after passage through said first layer, said second layer comprising resilient high-loft large surface area material;
a third layer for removing noxious gases such as oxides of nitrogen and carbon monoxide from the cooking discharges and for absorbing odors; and
a fourth layer for removing fine particles such as smoke from the cooking discharges,
said four layers providing progressive filtration at a singular location removing large particles first and then progressively smaller particles;
wherein:
said first layer is a mesh comprising multiple layers of slit and expanded material;
said second layer is selected from the group consisting of fiber glass, woven fabric, felted fabrics, or non-woven fibers or polymeric material such as polypropylene, polyethylene or polyester;

said third layer is selected from the group consisting of charcoal, silica gel, non-woven material impregnated with charcoal or cellulose base material impregnated with charcoal, or potassium permanganate impregnated crystals; and
said fourth layer is selected from the group consisting of fiber glass, felted polyethylene, spun polyethylene, woven polyethylene, felted polypropylene, spun polypropylene, woven polypropylene, or non-woven fabrics of polymeric materials such as polypropylene, polyethylene or polyester.

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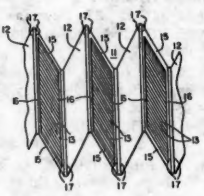
4,610,706

## HEPA FILTER WITH INTEGRAL SEPARATORS

Alexander G. Nesher, 216 Fitzwilliam La., Rosemont, Pa. 19010

Continuation-in-part of Ser. No. 463,527, Feb. 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 322,414, Nov. 18, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 654,328
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—497 7 Claims



1. A HEPA filter with provides laminar and turbulence free air flow which comprises
an outer frame,
a filter assembly carried within said frame,
said filter assembly is of filtering material in continuous strip form with a continuous succession of alternating flat panels and corrugated panels of the same size,
said corrugated panels having V-shaped horizontal corruga-

tions extending across the panels and vertical margins extending along said corrugations, and with crease means between the flat panels and the vertical margins of the corrugated panels for folding said panels.

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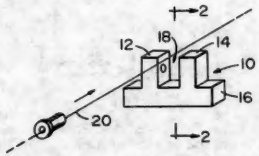
4,610,707

## BROKEN FILAMENT DETECTOR AND SYSTEM THEREFOR

Reed H. Grundy, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 5, 1985, Ser. No. 772,977
Int. Cl.[4] C08B *21/00*
U.S. Cl. 65—2 39 Claims




1. A method of determining with a high degree of reliability and accuracy the quality of an elongated article having random faults such as filament ends projecting outwardly therefrom, comprising:

moving an article to be measured at a high rate of speed along a path;

positioning a detector including a beam detecting source adjacent said path, said detector and its beam being sufficiently far from said path as to prevent the article from activating said beam detecting source but sufficiently close to enable random faults to pass through and activate said beam detecting source to produce corresponding event pulses;

accumulating a yardage count for each of said event pulses recorded by an event pulse counter;

transferring the yardage counts to a first storage location and resetting said event pulse counter; and

transferring each stored yardage count from said first storage to a second, processing, storage location.

24. Detector apparatus for determining with a high degree of reliability and accuracy the quality of an elongated article having random faults such as filament ends projecting therefrom, comprising:

an optoelectronic detector having a light source and a light receiver defining a light beam;

means for guiding an article to be measured along an article path past said detector and its light beam, said detector light beam being spaced from said article path sufficiently to prevent the article from interrupting said light beam, but being sufficiently close to said article path to enable random faults such as filaments ends projecting from the article to interrupt said light beam;

circuit means connected to said light receiver to produce an event pulse for each interruption of said light beam, said circuit means including amplifier means connected to said light receiver, and level detector means having a predetermined threshold and being connected to the input of a storage means which level detector means produces an event pulse whenever its threshold is exceeded;

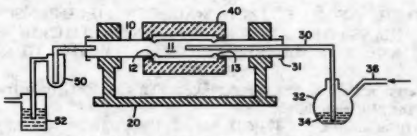
an integrator connected to the amplifier means to provide an integrator output which automatically regulates the light in said light source to maintain a predetermined amount of electrical output from the light receiver.

4,610,708

## METHOD FOR MAKING METAL HALIDE OPTICAL FIBER

Ahmad Sarhangi, Painted Post, and George W. Scherer, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,769
Int. Cl.[4] C03B *37/027*
U.S. Cl. 65—3.12 7 Claims




1. In a method for making an optical fiber preform which comprises the vapor deposition of layers of metal halide glass or glass-forming constituents on the inside surface of a silicate glass substrate tube in the presence of a fluorine-containing reactant capable of attacking and releasing silicon compounds from the inside surface of the substrate tube, the improvement comprising, prior to vapor deposition,

(a) providing a slurry coating of a sinterable, particulate, fluoride-resistant material on the inside surface of the tube, the slurry consisting essentially of the sinterable, particulate material and a volatilizable organic vehicle for the material;

(b) removing the volatilizable organic vehicle to leave a dry deposit of the particulate sinterable material; and

(c) heating the deposit to sinter the particulate material into a fluoride-resistant protective coating fused to the inside surface of the tube,

whereby the fused protective coating acts as a passivation layer to retard the release of silicon compounds from the inside surface of the tube.

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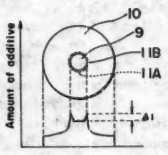
4,610,709

## METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Hiroshi Kawauchi, and Michihisa Kyoto, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 23, 1985, Ser. No. 694,284
Claims priority, application Japan, Jan. 24, 1984, 59-9499
Int. Cl.[4] C03B *37/018, 37/014*
U.S. Cl. 65—3.12 5 Claims




1. A method for producing a glass preform, comprising the steps of:

producing a soot preform which comprises a core portion and a cladding portion wherein a metal oxide additive concentration or a bulk density of a radially outer part of said core portion is larger than that of said cladding portion and is larger than that of the radially inner part of said core portion to a degree such that when said soot preform is heated, said radially outer part sinters first, and

heating said soot preform in an atmosphere containing fluo-

rine or a fluorine-containing compound until a transparent glass preform is formed,

the addition of the fluorine or fluorine-containing compound in the heating step being timed such that said radially outer part sinters before said cladding portion and thereby substantially prevents the penetration of fluorine into said inner part of said core portion.

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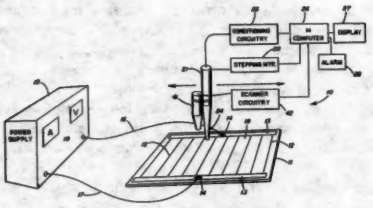
**4,610,710**

## METHOD FOR UTILIZING MAGNETIC FIELD SENSING MEANS FOR DETECTING DISCONTINUITIES IN A CONDUCTOR MEMBER ASSOCIATED WITH A GLASS SHEET

**Harry S. Koontz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 491,683, May 5, 1983, Pat. No. 4,542,333.**
**This application May 16, 1985, Ser. No. 734,715**
**Int. Cl.[4] C03C *27/02*; G01R *33/00, 31/08***
**U.S. Cl. 65—29** **10 Claims**



1. In a method for fabricating an electrically heatable glass sheet including the steps of applying a heater grid comprised of electroconductive paste material to a surface of the glass sheet, and thereafter heating the paste material to fuse the heater grid to the glass surface, the improvement comprising the step of employing a magnetic field sensing means, prior to the heating step, to determine which, if any, of the heater lines of the grid are defective prior to the paste material being fused to the glass surface, to facilitate removal and repair of the heater lines, if any, which have been determined to be defective.

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**4,610,711**

## METHOD AND APPARATUS FOR INDUCTIVELY HEATING MOLTEN GLASS OR THE LIKE

**Joseph M. Matesa, Plum Boro; Kwang J. Won, Murraysville, and Henry M. Demarest, Jr., Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 1, 1984, Ser. No. 656,292**
**Int. Cl.[4] C03B *5/02***
**U.S. Cl. 65—134** **24 Claims**

1. A method for melting material comprising:

feeding a stream of pulverulent material to a first vessel in which the material is supported on a sloped surface and liquefied by primarily radiant heat transfer,

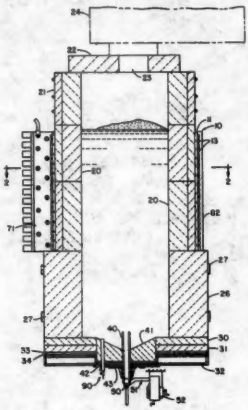
draining the liquefied material from the first vessel to a second vessel, in the second vessel increasing the temperature of

the liquefied material by imposing an alternating electromagnetic field on a volume of the liquefied material held in the second vessel so as to induce electric currents in the liquefied material.

18. Apparatus for melting materials comprising:

a first vessel having means for feeding a stream of pulverulent material, a sloped surface adapted to receive the incoming stream and to drain liquefied material from the vessel, and radiant heating means for liquefying the pulverulent material fed to the vessel; and

a second vessel adapted to receive liquefied material drained from the first vessel, and



having means to impose an alternating electromagnetic field on liquefied material held in the second vessel so as to increase the temperature of the liquefied material.

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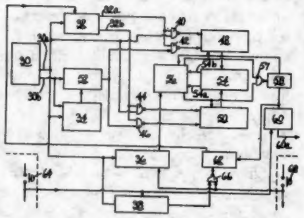
**4,610,712**

## APPARATUS FOR MONITORING THE CLOSING ACTION OF A MOULD OF A GLASSWARE FORMING MACHINE

**René Keller, Zurich, and Steven G. Merz, Thalwil, both of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.**

**Continuation of Ser. No. 666,079, Oct. 29, 1984, abandoned.**
**This application Mar. 21, 1986, Ser. No. 842,751**
**Claims priority, application United Kingdom, Nov. 11, 1983, 8330186**
**Int. Cl.[4] C03B *9/40***
**U.S. Cl. 65—158** **12 Claims**



1. Apparatus for monitoring the closing action of a mould in a glassware forming machine of the type in which the mould undergoes cyclic motion between open and closed positions, comprising:

pulse producing means associated with a portion of the mould which is moved in the closing action of the mould, for producing a plurality of pulses in response to the movement of said mould portion, the number of such pulses being essentially representative of the distance moved by said mould portion;

storage means for storing the number of pulses produced by said pulse producing means during each cycle as the mould portion is moved from a fixed position to mould closed position, and for storing a number of pulses equal to

the greatest number of pulses produced by the pulse producing means in previous cycles of operation;

comparing means for comparing in each cycle of operation of the machine after the closing action of the mould, the two numbers stored by the storage means, and for producing a stop signal in the event that the numbers differ by more than a predetermined number, wherein said stop signal is effective to prevent further closing actions of the mould; and

inhibiting means operative on receipt of an operator-initiated load memory signal to prevent the comparing means from operating for one cycle of operation of the machine.

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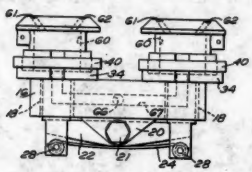
## 4,610,713
## SETTLE BLOW HEAD AND BAFFLE ARM ATTACHMENT FOR GLASSWARE MOLDING MACHINE

**Wallace H. Clegg, P.O. Box 113, East Killingly, Conn. 06243**

**Filed Dec. 24, 1984, Ser. No. 685,849**
**Int. Cl.⁴ C03B 9/00**
**U.S. Cl. 65—300** **1 Claim**



1. In a glass blowing machine having a carrier arm attached to an actuating shaft a plurality of holders mounted in said arm, each holder having a bayonet fitting at the lower end thereof and a pair of diametral slots in the periphery of the bayonet fitting, a retainer ring having inwardly directed diametral protruberances circumferentially spaced to engage said slots, each blow head-baffle construction having an upper end with diametral bosses that have a groove therein, the bosses loosely engaging the holder fitting whereby the grooves may align with the slots when the construction is rotated and the protruberances may engage in the grooves and loosely engage said grooves to secure the construction from dislodgment yet permit rocking of the blowhead baffle in the holder.

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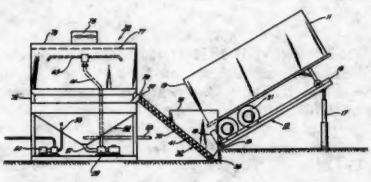
## 4,610,714
## APPARATUS AND METHOD FOR DISSOLVING UREA AND OTHER ENDOTHERMIC MATERIALS

**Bruce Harbolt, Northridge; Perry L. Murata, Torrance, and Neal C. Burmaster, Anaheim, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Filed Nov. 5, 1984, Ser. No. 668,036**
**Int. Cl.⁴ C05C 9/00**
**U.S. Cl. 71—28** **10 Claims**



1. A method for dissolving an endothermic material in water which comprises the steps of,

(a) forming a slurry of said endothermic material in water, said slurry comprising a solution of said endothermic material in water and an undissolved phase comprising said endothermic material,

(b) forming droplets of said slurry of step (a),

(c) contacting said droplets in direct heat exchange relationship, with a moisture-containing air stream having a temperature greater than said slurry, at conditions whereby both heat and moisture is removed from said moisture-containing air thereby dissolving at least a portion of said undissolved phase, and

(d) recovering the product of step (c).

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## 4,610,715
## PROCESS FOR PREPARING FERTILIZERS RELEASING NITROGEN SLOWLY

**Remo Monaldi, Mestre, and Raffaello Fortibuoni, Porto Marghera, both of Italy, assignors to Montedison S.p.A., Milan, Italy**

**Filed May 23, 1983, Ser. No. 497,042**
**Claims priority, application Italy, May 27, 1982, 21508 A/82**
**Int. Cl.⁴ C05C 9/00**
**U.S. Cl. 71—28** **4 Claims**

1. In a process for the manufacture of a fertilizer containing ureaform and at least one solid fertilizing material different from ureaform and selected from the group consisting of urea, ammonium sulphate, ammonium nitrate, phosphoric acid, ammonium phosphates having different degrees of ammoniation in the solid state or in aqueous suspension, potassium chloride, potassium sulphate, superphosphate, supertriple and mixtures thereof, wherein, in a first step, urea and formaldehyde are brought into contact at 40° to 55° C. in an aqueous medium, according to urea/formaldehyde molar ratios from 1.4 to 1.8, the water/urea ratio being from 1 to 2 and the pH of the reaction mixture being from 2 to 3.5, thus obtaining an aqueous suspension, the improvement consisting essentially in that:

(a) in a second step said aqueous suspension from said first step is admixed at 70° to 80° C., within a granulator, with said solid fertilizing material different from ureaform, and with a solid recycle stream, the pH of the admixture being from 4.5 to 5.5 during the major protion of the granulation time;

(b) at the end of the granulation time the pH is increased to a level between 6 and 6.5; and

(c) after the granulation, the thus-obtained fertilizer is dried at 85° to 100° C. and a recycle stream of the dried and solid fertilizer is fed back to said second step (a).

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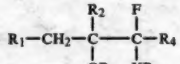
## 4,610,716
## FLUORINATED AZOLYL ETHANOL GROWTH REGULATORS AND MICROBICIDES

**Elmar Sturm, Aesch; Urs Müller, Münchenstein, and Hans Tobler, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Andsley, N.Y.**

**Filed Dec. 5, 1983, Ser. No. 558,140**
**Claims priority, application Switzerland, Dec. 14, 1982, 7270/82**
**Int. Cl.⁴ A01N 43/50, 43/653; C07D 233/60, 249/08**
**U.S. Cl. 71—76** **16 Claims**

1. A compound of the formula



in which $R_1$ is an azolyl group selected from the group consisting of 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl and imidazol-1-yl; $R_2$ is $C_1$–$C_{12}$-alkyl; $R_3$ is hydrogen, $C_1$–$C_{12}$-alkyl, $C_2$–$C_4$-alkenyl or $C_2$–$C_4$-alkynyl, or benzyl which is unsubstituted or substituted by $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, $C_1$–$C_6$-haloalkyl, halogen or cyano; $R_4$ is hydrogen, fluorine or $C_1$–$C_6$-alkyl; $R_5$ is an unsubstituted or substituted radical chosen from the series consisting of phenyl, naphthyl, biphenyl, benzylphenyl and

benzyloxyphenyl, the substituents being chosen from the series consisting of halogen, cyano, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, $C_1$–$C_6$-haloalkyl, $C_1$–$C_6$-alkylthio, $C_1$–$C_6$-haloalkoxy, $C_1$–$C_3$-haloalkylthio, nitro or thiocyano; and X is oxygen or sulfur; including an acid addition salt, quaternary azolium salt or metal complex.

6. A composition for the control of or prevention of attack by microorganisms or for regulating plant growth, which contains a compound of claim 1 in an amount effective to provide said control, prevention or regulation and a carrier.

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**4,610,717**

**CERTAIN 5-(R-OXY)-1-PHENYL OR (3-(TRIFLUOROMETHYL)PHENYL)TRIAZOLES, USEFUL FOR CONTROLLING UNDESIRED PLANT GROWTH**

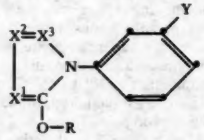
**Muzammil M. Mansuri, Cheshire, Conn., and Alasdair McArthur, Dare, England, assignors to Shell Oil Company, Houston, Tex.**

**Filed Nov. 26, 1985, Ser. No. 802,795**

**Int. Cl.[4] A01N *43/647, 43/653;* C07D *249/06, 249/12***

**U.S. Cl. 71—92** **8 Claims**

1. A compound of the formula



(I)

wherein two of $X^1$, $X^2$ and $X^3$ are nitrogen atoms and the third is $=CR^1-$ wherein $R^1$ is hydrogen or methyl, R is pyridyl, cyclohexyl, phenyl or phenyl substituted by one substituent selected from halogen, methyl, methoxy, trifluoromethyl and cyano, and Y is hydrogen or trifluoromethyl.

7. A method of combatting unwanted plant growth at a locus that comprises applying to the locus an effective amount of a compound according to claim 1.

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**4,610,718**

**METHOD FOR MANUFACTURING ULTRA-FINE PARTICLES**

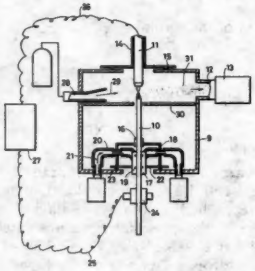
**Takeshi Araya, Higashikurume; Ryoji Okada; Yoshiro Ibaraki, both of Ibaraki; Susumu Hioki, Kashiwa; Masatoshi Kanamaru, Ibaraki; Yoshishige Endo, Ibaraki, and Mitsuaki Haneda, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 24, 1985, Ser. No. 726,651**

**Claims priority, application Japan, Apr. 27, 1984, 59-83715; Apr. 27, 1984, 59-83711; Apr. 27, 1984, 59-83710**

**Int. Cl.[4] B01J *2/04***

**U.S. Cl. 75—0.5 C** **6 Claims**



1. In a method wherein ultra-fine particles are manufactured by employing for at least one of the electrodes a material to vaporize into the ultra-fine particles and striking arcs across one pair of electrodes, the steps of setting at least either of an arc current or of an arc voltage at a value to generate plasma currents from end parts of said electrodes toward intermediate parts of the arcs, and causing said arc current to flow with a current value which is smaller than a current value $T_A$ which equals $aL+b$, where L is a distance between the material and opposite electrode, 30 A/mm$\geqq$a$\geqq$2 A/mm, and 200 A/mm$\geqq$b$\geqq$0.

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**4,610,719**

**METHOD OF AN APPARATUS FOR MAKING METAL POWDER**

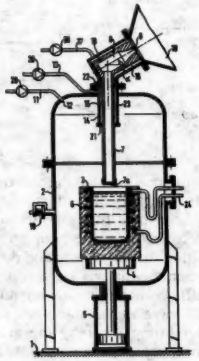
**Joseph M. Wentzell, Remsen, N.Y., assignor to Nyby Uddeholm Powder AB, Torshalla, Sweden**

**Continuation of Ser. No. 694,434, Jan. 24, 1985, abandoned. This application Sep. 24, 1985, Ser. No. 779,311**

**Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402500**

**Int. Cl.[4] B22D *23/08;* B05B *17/00***

**U.S. Cl. 75—0.5 C** **12 Claims**



1. A method of making metal powder by atomizing a metal melt out of a riser, characterized by the following method steps:

(a) mixing of the metal melt with gas, preferably an inert gas,

(b) pressurizing the metal melt mixed with the gas by a, preferably inert, pressure gas, forming metal droplets which can in part be hollow. the pressure gas at the same time serving to

(c) blow the metal droplets at elevated speed or in accelerated fashion into an expansion chamber, at the same time, forming the finest, solid metal powder.

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**4,610,720**

**METHOD FOR PREPARING HIGH PURITY VANADIUM**

**Frederick Schmidt, and O. Norman Carlson, both of Ames, Iowa, assignors to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Filed May 16, 1984, Ser. No. 610,905**

**Int. Cl.[4] C22B *34/22***

**U.S. Cl. 75—84** **9 Claims**

1. A method of preparing high-purity, low-silicon vanadium metal from vanadium pentoxide containing silicon, iron and other impurities comprising:

mixing the vanadium pentoxide with aluminum to form a reaction mixture, the quantity of aluminum in the mixture being from about stoichiometric to about 10% deficient in

the amount necessary to completely reduce the vanadium pentoxide to vanadium metal:

heating the mixture under reducing conditions to a temperature sufficient to react the mixture to reduce the vanadium pentoxide and form a vanadium-aluminum alloy containing silicon, iron and from about 0.6 to about 3 weight percent oxygen;

heating the alloy under reduced pressure to a temperature sufficient to vaporize the aluminum and iron in the alloy and to react the silicon with some of the oxygen to form volatile silicon monoxide which vaporizes away from the alloy thereby removing aluminum, iron, silicon and some of the oxygen from the vanadium metal, and

heating the vanadium metal in the presence of calcium metal to a temperature and for a period of time sufficient for the oxygen to diffuse from the vanadium and react with the calcium to form calcium oxide, thereby removing oxygen from the vanadium metal, forming a high-purity, low-silicon vanadium metal.

9. A method of preparing high purity, low silicon vanadium metal from vanadium pentoxide containing silicon, iron and other impurities comprising:

mixing vanadium pentoxide with aluminum to form a reaction mixture, the quantity of aluminum in the mixture being about 5% deficient in the amount necessary to completely reduce the vandium pentoxide to vanadium metal,

heating the mixture in a reduction bomb to a temperatue sufficient to react the aluminum and the vanadium pentoxide to form an aluminum-vanadium alloy containing silicon, iron, and about 1.5% oxygen,

melting the alloy by electron beam melting at a pressure from about $2\times10^{-5}$ to about $2\times10^{-6}$ torr to vaporize the aluminum and iron and to react the silicon with some of the oxygen, forming volatile silicon monoxide which vaporizes away, thus removing the silicon from the vanadium metal;

forming the molten vanadium metal containing oxygen into platelets have a thickness of up to about 2 mm,

heating the platelets in the presence of calcium metal to about 1000° C. for a period of time sufficient for the oxygen to diffuse from the vandadium metal and react with the calcium forming calcium oxide on the surface of the vanadium,

contacting the platelets with an acid to dissolve the calcium oxide, and

heating the platelets to about 800° C. under a reduced pressure of about $5\times10^{-5}$ torr to dehydride the platelets, thereby forming a high-purity, low-silicon vanadium metal.

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## 4,610,721
## TWO-STAGE LEACHING PROCESS FOR STEEL PLANT DUSTS

**Willem P. C. Duyvesteyn, Benthuisen, Netherlands, and Mahesh C. Jha, Arvada, Colo., assignors to AMAX Inc., Greenwich, Conn.**

**Filed Jan. 31, 1985, Ser. No. 696,980**
**Int. Cl.⁴ C22B 3/00**
**U.S. Cl. 75—97 A** **10 Claims**

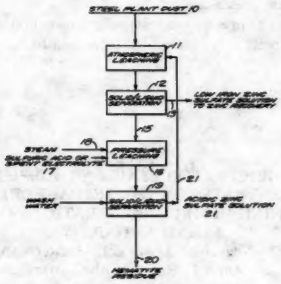
1. A process for selectively recovering zinc from iron-containing steel plant dust which comprises,

atmospherically leaching said iron-containing steel plant dust in a first stage wherein an amount of said steel plant dust is mixed with an amount of sulfuric acid solution of concentration at least sufficient to leach zinc therefrom and provide a terminal pH ranging from about 2 to 3.5, thereby limiting iron dissolution,

subjecting said mixture to a crude liquid/solid separation step whereby a thickened pulp is produced containing zinc and iron values and a separated liquid provided containing zinc which solution is sent to zinc recovery,

subjecting said thickened pulp together with additional sulfuric acid-containing solution in a second stage to pressure leach said thickened pulp at an elevated pressure and temperature at least sufficient to leach the remaining zinc value and provide an acid zinc sulfate solution thereof, while converting hydrated iron oxides into free settling hematite residue,

the amount of additional sulfuric acid added to said thickened pulp being sufficient to obtain dissolution of the zinc while inhibiting iron dissolution,



separating said hematite residue from said acid zinc sulfate solution,

and recycling said acid zinc sulfate solution to atmospheric leaching.

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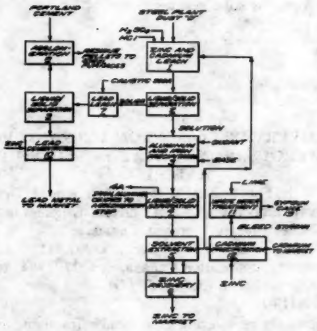
## 4,610,722
## PROCESS FOR METAL RECOVERY FROM STEEL PLANT DUST

**Willem P. C. Duyvesteyn, Benthuisen, Netherlands, and Robert F. Hogsett, Arvada, Colo., assignors to AMAX Inc., Greenwich, Conn.**

**Filed Jan. 31, 1985, Ser. No. 696,977**
**Int. Cl.⁴ C22B 3/00**
**U.S. Cl. 75—97 A** **9 Claims**



1. A process for the hydrometallurgical treatment of steel plant dust containing iron, lead, zinc, and at least one of cadmium, aluminum, calcium, chlorides and fluorides of sodium, potassium and magnesium as impurities which comprises,

mixing a charge of said dust with an acid solution containing a mixture of hydrochloric acid and sulfuric acid, the amount of hydrochloric acid being at least stoichiometrically sufficient to react with and form a solution of at least one of zinc and cadmium, and maintain a pH in the range of about 1.5 to about 2.5,

the amount of sulfuric acid being at least stoichiometrically sufficient to react with lead and form a precipitate of lead sulfate,

leaching said dust with said solution at a temperature ranging from ambient up to the boiling point,

subjecting said solution of solid/liquid separation to remove the lead sulfate precipitate and provide a filtrate containing iron and zinc and at least one of aluminum and cadmium, oxidizing said filtrate and adding a neutralizing agent to raise the pH to a level selective to the precipitation of iron and aluminum present,

separating the precipitate from said filtrate containing zinc, and selectively recovering zinc from said filtrate.

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**4,610,723**

## PROCESS FOR LEACHING SULPHIDE CONCENTRATES OF THE TETRAHEDRITE TYPE CONTAINING HIGH CONCENTRATIONS OF ARSENIC AND ANTIMONY

**Eduardo D. Nogueira, Avda. del Mediterraneo 47, 28007-Madrid, and Angel L. Redondo Abad, Marcenado 19, 28002-Madrid, both of Spain**

**Filed Oct. 1, 1984, Ser. No. 656,740**

**Claims priority, application Spain, Oct. 4, 1983, 526.235**

**Int. Cl.[4] C22B *15/00***

**U.S. Cl. 75—101 R** **8 Claims**

1. A process for leaching tetrahedrite copper sulphide concentrates containing arsenic and antimony which comprises: slurrying the tetrahedrite copper concentrate in a ferrous sulphate aqueous solution to obtain a solid-liquid ratio higher than 40 Kg of solids per cubic meter of solution; subjecting said slurry to an oxidation leach in a stirred pressure reactor at an oxygen partial pressure higher than 3 $Kg/cm^2$ and a temperature in the range of from 140° C. to 250° C. for complete oxidation of metal sulphides to sulphates and precipitation of iron as ferric arseniate and ferric antimoniate; separating the reaction mixture into a solid residue containing the ferric arseniate and ferric antimoniate and insoluble non-ferrous metal sulphates, and a leach liquor containing sulphuric acid, and copper sulphate; and recovering the metal from the leach liquor and from the solid residue.

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**4,610,724**

## RECOVERY OF GOLD FROM REFRACTORY AURIFEROUS IRON-CONTAINING SULPHIDIC MATERIAL

**Donald R. Weir, Fort Saskatchewan, and Roman M. Genik-Sas-Berezowsky, Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada**

**Filed Mar. 4, 1985, Ser. No. 707,711**

**Claims priority, application Canada, Sep. 27, 1984, 464183**

**Int. Cl.[4] C22B *11/04***

**U.S. Cl. 75—118 R** **9 Claims**

1. A process for recovering gold from refractory auriferous iron-containing sulphidic material comprising:

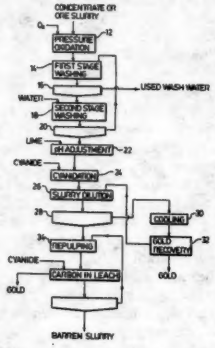
treating an aqueous slurry of the material in a pressure oxidation step at a temperature in the range of from about 135° to about 250° C. under a total pressure of from about 500 to about 5000 kPa to oxidize sulphide sulphur to sulphate form and release gold from a refractory state,

adjusting the pH of the resultant oxidized slurry to a value suitable for cyanidation,

subjecting the pH adjusted slurry to a cyanidation step in which gold is dissolved in a cyanide solution,

diluting the cyanided slurry to a pulp density in the range of from about 2 to about 10% solids by weight,

subjecting the diluted slurry to a liquid-solids separation step to produce a gold containing solution and a relatively high pulp density gold-containing slurry, and




separately recovering gold from the gold-containing solution and from the high pulp density gold-containing slurry.

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**4,610,725**

## CONTINUOUS EXTRUSION OF METALS

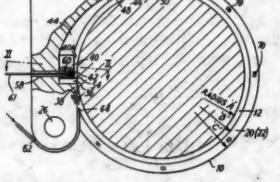
**John East, 138 Windrush, Highworth, Wiltshire SN6 7DX, and Ian Maxwell, 1 St. Anne's Road, Caversham, Reading, Berkshire, both of England**

**Filed Jan. 27, 1984, Ser. No. 574,511**

**Claims priority, application United Kingdom, Feb. 3, 1983, 8302951; Apr. 12, 1983, 8309836**

**Int. Cl.[4] B22F *1/00***

**U.S. Cl. 75—228** **29 Claims**



1. Apparatus for effecting continuous extrusion of metal from a feedstock in particulate, comminuted or solid form, which apparatus includes:

(a) a rotatable wheel member (**10**) arranged for rotation when in operation by a driving means, said wheel member having formed peripherally thereon a continuous circumferential groove (**12**);

(b) a cooperating shoe member (**24**) which extends circumferentially around a substantial part of the periphery of said wheel member and which has a portion (**30**) which projects in a radial direction partly into said groove with small working clearance (**32,34**) from the side walls (**14**) of said groove, said shoe member portion defining with the walls of said groove an enclosed passageway (**48**) extending circumferentially of said wheel member;

(c) feedstock inlet means (**50,52**) disposed at an inlet end of said passageway (**48**) for enabling feedstock to enter said passageway at said inlet end whereby to be engaged and

carried frictionally by said wheel member, when rotating, towards the opposite, outlet end of said passageway;

(d) an abutment member (36) carried on said shoe member (24) and projecting radially into said passageway (48) at said outlet end thereof so as to substantially close said passageway at that end and thereby impede the passage of feedstock frictionally carried in said groove (12) by said wheel member, thus creating an extrusion pressure in said passageway at said outlet end thereof;

(e) a die member (40,42) carried on said shoe member and having a die orifice opening (42) from said passageway (48) at said outlet end thereof, through which orifice feedstock carried in said groove (12) and frictionally compressed by rotation of said wheel member (10), when driven, is compressed and extruded in continuous form, to exit from said shoe member (24) via an outlet aperture (60,58); and

(f) cooling means (62,64) disposed immediately downstream of said abutment member and arranged for connection, when the apparatus is in operation, to a source of cooling fluid under pressure, said cooling means being arranged to direct cooling fluid from said source at an external cooling surface of at least said abutment member (36), which cooling surface is exposed for cooling at and accessible from the downstream side of said abutment member.

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4,610,726

## DENSE CERMETS CONTAINING FINE GRAINED CERAMICS AND THEIR MANUFACTURE

Harry L. King, Hudson, Ohio, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed Jun. 29, 1984, Ser. No. 626,451
Int. Cl.[4] C22C *29/12*
U.S. Cl. 75—233 27 Claims

1. In the method of producing a ceramic-metal composite (cermet) containing boride-oxide ceramic having components of a first metal boride and a second metal oxide, which ceramic is in mixture in the cermet with elemental metal of said second metal, wherein said cermet is produced by sintering a reaction mixture of first metal oxide, boron oxide and said elemental second metal, the improvement comprising,

A. combining for said reaction mixture:

(a) first metal oxide;

(b) boron oxide;

(c) ceramic component in very finely divided form; and

(d) elemental second metal in very finely divided form and in an amount of at least a 100 percent molar excess beyond that amount stoichiometrically required to produce said second metal oxide during sintering; and

B. sintering said reaction mixture in inert gas atmosphere.

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4,610,727

## RECORD MEMBER

Jerome R. Bodmer, and Robert E. Miller, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Division of Ser. No. 612,943, May 23, 1984, Pat. No. 4,540,998. This application Aug. 5, 1985, Ser. No. 762,741
Int. Cl.[4] C09D *11/00*; B41M *5/16, 5/22*
U.S. Cl. 106—21 15 Claims

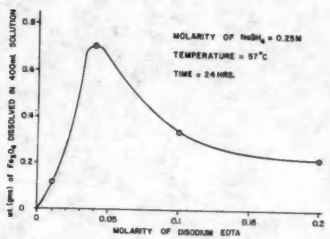
1. A color developer obtained by the process comprising mixing together and heating an addition product of phenol and a diolefinic alkylated or alkenylated cyclic hydrocarbon, zinc oxide, benzoic acid and ammonium hydroxide.

4,610,728

## METHOD AND COMPOSITION FOR DISSOLVING DEPOSITS OF MAGNETITE

Ram Natesh, 790 E. 700 South, Centerville, Utah 84105, and Mario A. Sellani, 956½ Garfield Ave., Salt Lake City, Utah 84014

Continuation-in-part of Ser. No. 435,264, Oct. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,383, May 26, 1981, abandoned. This application Dec. 14, 1984, Ser. No. 681,609
Int. Cl.[4] C23G *1/19, 1/24*
U.S. Cl. 134—2 9 Claims




1. A process for dissolving deposits of magnetite from a metal surface comprising contacting said metal surface with an aqueous solution maintained at a pH from neutral to alkaline and containing from 0.01 to 0.8 mol of an alkali metal borohydride and from 0.01 to 0.6 mol of an iron chelating agent per liter of said solution.

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4,610,729

## REMOVAL OF CHLORINE-BASED CONTAMINANTS FROM MATERIALS CONTAMINATED WITH SAME

James Keane, York, Pa., assignor to Linnola Ltd., Blackrock, Ireland

Continuation-in-part of Ser. No. 661,719, Oct. 17, 1984, which is a continuation of Ser. No. 274,433, Jun. 17, 1981, abandoned. This application Aug. 13, 1985, Ser. No. 765,111
Int. Cl.[4] B08B *3/04*; B01D *11/00, 13/00*
U.S. Cl. 134—25.1 17 Claims

1. A method of removing a chlorine-based contaminant from a surface of a substrate covered with same, which comprises the steps of:

(a) dissolving said contaminant in a first solvent to form a solution thereof;

(b) admixing a further solution consisting of a membrane-like material forming component derived from mineral crude oil, bitumen or amphipathic lipids in a second solvent selected from the group consisting of halogenated hydrocarbons and p-xylene, said second solvent being miscible with said first solvent and capable of forming in the presence of water and said membrane-like material forming component an interfacial membrane-like material which has a water side and is impermeable to said contaminant; and

(c) intimately contacting water with the surface of said substrate so as to cause said membrane-like material to form at the surface of the substrate with said water side oriented toward said surface while the water wets said surface and spreads thereover, whereby said membrane-like material incorporates during its formation the contaminant and mixture of solvents adjacent said surface and the water displaces said membrane-like material away from said surface as it is being formed thereacross to thereby separate the contaminant and mixture of solvents from said surface and cover said surface with a layer of water, said membrane-like material acting as a barrier to maintain said contaminant in solution with said mixture of

solvents and to prevent passage of same into said water layer.

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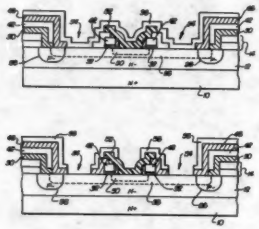
4,610,730

## FABRICATION PROCESS FOR BIPOLAR DEVICES

Alan L. Harrington, Hawthorne, and Vladimir Rodov, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 20, 1984, Ser. No. 684,426
Int. Cl.[4] H01L *21/263, 21/22*
U.S. Cl. 148—1.5 12 Claims



1. A method for the fabrication of bipolar devices with ultra-shallow device junctions, the method comprising the steps of:

forming a semiconductor substrate;

defining on the substrate the peripheries of a plurality of semiconductor regions;

successively ion-implanting the plurality of regions at temperatures low enough to preclude annealing or activation; and

subsequently annealing the ion-implanted regions in one short thermal annealing step that minimizes further diffusion of the implanted materials;

wherein the device is not exposed to high temperatures during processing, and therefore is produced with a minimum of defects.

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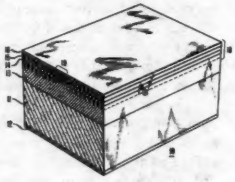
4,610,731

## SHALLOW IMPURITY NEUTRALIZATION

Jacques P. Chevallier, Maurepas, France; William C. Dautremont-Smith, Westfield, and Charles W. Tu, Bridgewater, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 3, 1985, Ser. No. 719,503
Int. Cl.[4] H01L *21/265, 21/263*
U.S. Cl. 148—1.5 14 Claims



1. A process for producing a III–V semiconductor device from at least one III–V semiconductor compound comprising a doped region with one or more shallow donor dopants having energy level within about 150 mev of the conduction band CHARACTERIZED IN THAT the process comprises the step of incorporating atomic hydrogen into a first portion of the doped region thereby increasing the resistivity of the first portion of the doped region.

4,610,732

## METHOD OF INHIBITING CORROSION OF ZIRCONIUM OR ITS ALLOY

Yuko Sasaki; Katsumi Suzuki; Akira Minato, all of Hitachi, and Tomio Yoshida, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,398
Claims priority, application Japan, Mar. 23, 1984, 59-55713
Int. Cl.[4] C23C *25/58*
U.S. Cl. 148—6.14 R 9 Claims

1. A method of inhibiting corrosion of zirconium or its alloy, wherein zirconium or its alloy is surface-treated with a nitric acid containing a ruthenium ion.

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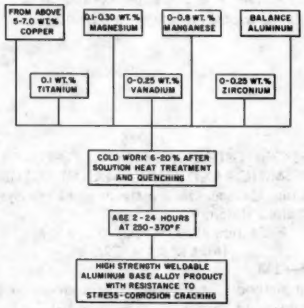
4,610,733

## HIGH STRENGTH WELDABLE ALUMINUM BASE ALLOY PRODUCT AND METHOD OF MAKING SAME

Robert E. Sanders, Jr., and Jocelyn I. Petit, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 18, 1984, Ser. No. 683,021
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A 23 Claims


FROM ABOVE 5-7.0 WT.% COPPER
0.1-0.30 WT.% MAGNESIUM
0-0.8 WT.% MANGANESE
BALANCE ALUMINUM
0.1 WT.% TITANIUM
0-0.25 WT.% VANADIUM
0-0.25 WT.% ZIRCONIUM
COLD WORK 6-20 % AFTER SOLUTION HEAT TREATMENT AND QUENCHING
AGE 2-24 HOURS AT 250-370°F
HIGH STRENGTH WELDABLE ALUMINUM BASE ALLOY PRODUCT WITH RESISTANCE TO STRESS-CORROSION CRACKING

15. A method of making an aluminum base alloy product characterized by high strength including high resistance to ballistic penetration, resistance to stress-corrosion cracking, and weldability, comprising the steps of:

(a) forming an alloy consisting essentially of from above 5 wt. % to 7 wt. % copper, 0 to 0.8 wt. % manganese, 0.1 wt. % titanium, 0 to 0.25 wt. % vanadium, 0 to 0.25 wt. % zirconium and 0.1 to 0.3 wt. % magnesium with the balance consisting essentially of aluminum;

(b) cold working the alloy an amount equal to at least 6% stretching at room temperature after solution heat treatment and quenching: and

(c) aging the cold worked alloy for at least 2 hours at a temperature of at least 121° C. (250° F.).

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4,610,734

## PROCESS FOR MANUFACTURING CORROSION RESISTANT CHROMIUM STEEL

Jürgen Hartwig, and Paul Pant, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Division of Ser. No. 587,210, Mar. 7, 1984. This application Mar. 1, 1985, Ser. No. 706,945
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310693
Int. Cl.[4] H01F *1/00*
U.S. Cl. 148—120 7 Claims

1. A process for producing a corrosion resistant chromium steel which comprises 3 to 45% chromium; 0 to 10% manganese; 0.001 to 0.5% carbon; 0.2 to 5% nitrogen; 0 to 2% silicon; 0 to 10% nickel; 0 to 10 % molybdenum; 0 to 5% vanadium; 0

to 2% titanium, niobium and/or tantalum; 0 to 0.3% aluminum; 0 to 1% cerium; the remainder being iron; and having a structure containing at least 50% ferromagnetic structural components, is magnetizable and, at 400° C., has a yield strength of $R_{p0.2}>400$ N/mm$^2$ and, at 600° C., has a yield strength of $R_{p0.2}>250$ N/mm$^2$, the process comprising the steps of (a) introducing nitrogen by electric slag remelting into a prealloy comprising 3 to 45% chromium; 0 to 10% manganese; 0.001 to 0.5% carbon; 0 to 2% silicon; 0 to 10% nickel; 0 to 10% molybdenum; 0 to 5% vanadium; 0 to 2% titanium, niobium and/or tantalum; 0 to 0.3% aluminum; 0–1% cerium, the remainder being iron; and having a structure containing at least 50% ferromagnetic structural components; until a nitrogen content of between 0.2 and 5% is reached in the prealloy; wherein nitrogen enrichment by electric slag remelting takes place under greater than atmospheric pressure, at least part of the nitrogen introduced is in the form of solid nitrogen carriers, and the nitrogen content of the nitrogen enriched alloy is at least 10% greater than the nitrogen solubility limit of the alloy at 1 bar and 20° C.; (b) hot working the nitrogen enriched alloy; (c) annealing at 800° to 1250° C.; and (d) then cooling to room temperature.

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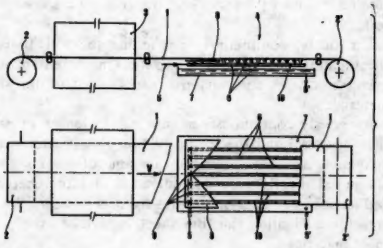
**4,610,735**

## METHOD OF MODULATED COOLING TO MINIMIZE DEFORMATION OF FLAT METALLURGICAL PRODUCTS

**Bruno Dubost, Saint-Egreve, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France**

**Filed Sep. 28, 1984, Ser. No. 655,546**
**Claims priority, application France, Sep. 29, 1983, 83 15823**
**Int. Cl.[4] C21D *1/18***
**U.S. Cl. 148—128** **10 Claims**



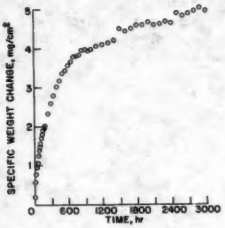
1. A method for rapidly and continuously cooling a flat metallurgical product, having a longitudinal axis, at an initial and substantially uniform temperature $T_O$, to minimize deformation of said product, which comprises contacting said flat metallurgical product with at least one vaporizable fluid, at an initial temperature $T_f$, on a zone comprised between a starting front having an origin, O, and a trailing edge, on one or both sides of the product, said cooling being modulated in the transverse direction to the length of the product, whereby cooling curves for points located on the same transverse direction intersect in a temperature range comprised between $T_s=\frac{1}{3}(2T_O+T_f)$ and $T_i=\frac{1}{3}(T_O+2T_f)$, the temperature of the axis remaining below that of the edges, at least within the temperature range $T_O$-$T_s$ and remaining over, at least within the temperature range $T_i$-$T_f$.

**4,610,736**

## NICKEL BASE COATING ALLOY

**Charles A. Barrett, Fairview Park, and Carl E. Lowell, Lakewood, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Mar. 23, 1983, Ser. No. 478,131**
**Int. Cl.[4] C22C *19/03***
**U.S. Cl. 148—429** **7 Claims**




1. An improved oxidation resistant nickel base alloy consisting essentially of
an intermetallic (beta) alloy containing about 30 weight percent aluminum,
between about 0.05 weight percent to about 0.25 weight percent zirconium, and
the remainder being nickel.

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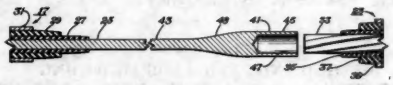
**4,610,737**

## CABLE SPLICE METHOD USING TRANSITION ROD

**William H. Bacon, and Francis S. O'Toole, both of Claremore, Okla., assignors to Hughes Tool Company, Houston, Tex.**

**Filed Oct. 18, 1985, Ser. No. 789,204**
**Int. Cl.[4] B21F *15/08***
**U.S. Cl. 156—49** **3 Claims**



1. A method of splicing a submersible pump motor lead to a three-phase power cable, the motor lead and the power cable each having three conductors, with the conductors of the motor lead being smaller in diameter than the conductors of the power cable, the method comprising in combination:
providing a plurality of metal transition rods, each with a larger diameter on one end than on the other end, and with a tapered section located between the ends;
joining each conductor of the motor lead to the smaller end of one of the rods;
joining each conductor of the power cable to the larger end of one of the rods; then
insulating the rods.

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**4,610,738**

## ENCAPSULATING A SPLICE WITH A GEL-FILLED CASE

**James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

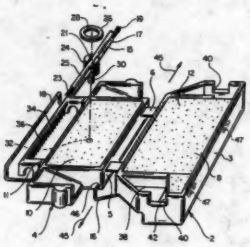
**Filed Jan. 4, 1985, Ser. No. 688,849**
**Int. Cl.[4] H02G *1/14***
**U.S. Cl. 156—49** **13 Claims**

1. A splice case for encapsulating a substrate comprising:
at least one gel having a cone penetration value from approx-

imately 100 to 350 ($10^{-1}$ mm) and an ultimate elongation of at least approximately 200%;

first and second open containers for containing said gel, an exposed first surface of said gel in the first container having a cross-sectional area which exceeds a second cross-sectional area of an exposed second surface of said gel in the second container, said first and second surfaces adapted for confronting and contacting each other, the first and second containers being sized so as to be capable of telescopically mating in a vicinity of the first and second surfaces; and

spring means exerting a resilient force for continuously maintaining said first and second containers biased towards one another over a finite range with at least a threshold force.



13. A method of encapsulating a splice between first and second electrical conductors, comprising the steps of:

placing a splice on an exposed first surface of a gel contained in a first container;

placing the exposed first surface of the gel in contact with an exposed second surface of a second gel in a second container such that the splice is surrounded by the gel in the first and second containers, the first and second gels having a cone penetration between 100 and 350 ($10^{-1}$ mm), and an ultimate elongation of at least approximately 200%; and

maintaining a continuous pressure by exerting a resilient force between the first and second gel surfaces.

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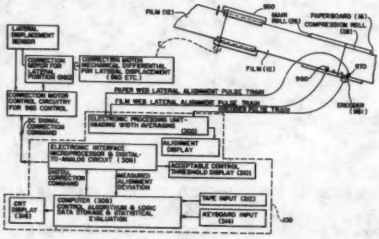
**4,610,739**

## METHOD AND DEVICE FOR PROVIDING LONGITUDINAL AND LATERAL STRETCH CONTROL IN LAMINATED WEBS

**James W. Jensen, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.**

**Filed Nov. 2, 1984, Ser. No. 667,869**
**Int. Cl.[4] B32B *31/08*; G01B *21/06***
**U.S. Cl. 156—64** **50 Claims**



1. An apparatus for laminating a moving web of plastic film material to a moving web of paper material to form a moving web of laminated composite, the film material passing through the apparatus in a continuous longitudinally extending web having an upstream portion entering the apparatus and a downstream portion exiting the apparatus; the film material normally being extensibly deformable such that the distance between any two reference points on the film web is stretchably variable prior to lamination; the apparatus comprising:

(a) paper supply unwind roll means for providing a continuous supply of paper to be laminated;

(b) film supply unwind roll means for providing a continuous supply of film to be laminated;

(c) laminating nip means, for drawingly engaging said film web and said paper web in parallel touching contact whereby each said web is moved at the same web speed, and for bondingly compressing said film web to said paper web to form a laminated composite;

(d) film web lateral stretch control means positioned along said film web between said film supply unwind roll means and said laminating nip means for frictionally engaging said film web and for selectively varying the width of the portion of the film web passing therethrough from a first width at a position where the film web enters said lateral stretch control means to a second width at a position where the film web leaves said lateral stretch control means during continuous movement of the film web from said film unwind roll means through said laminating nip;

(e) film width monitoring means for measuring the width of predetermined portions of said film web at a position downstream from said film web lateral stretch control means and for providing a monitor signal to a signal processing means;

(f) signal processing means for comparing said monitor signal to a predetermined film width value and providing command signals responsive thereto to said film web lateral stretch control means for imparting a selected amount of lateral deformation to said film web whereby said film web is continuously extensibly adjusted to a predetermined width by said lateral stretch control means.

17. A method of laminating paper sheet material in roll form to plastic film sheet material in roll form by use of an adhesive material comprising the steps of:

mounting a roll of the paper sheet material on a first feed roll;

mounting a roll of the film sheet material on a second feed roll;

simultaneously, continuously unwinding the roll of paper sheet material and the roll of film sheet material to provide a length of paper sheet material and a length of film sheet material;

simultaneously continuously advancing the length of paper sheet material and the length of film sheet material to a laminating station comprising a main roll means and a compression roll means defining a nip area therebetween and an adhesive applying means located adjacent the nip area for laminating the film sheet material to the paper sheet material;

continuously applying adhesive material between the paper sheet material and the film material in the nip area;

applying pressure to the paper sheet material and the film sheet material and the adhesive material during passage through the nip area to form a fixed lamination;

passing the length of film sheet material past adjustable guide means located between the lamination station and the feed roll means and variably adjusting the guide means to laterally stretch the film material passing therethrough;

sampling the lateral distance between fixed indicia on the film web downstream of the adjustable guide means and generating a control signal representative of that distance; and

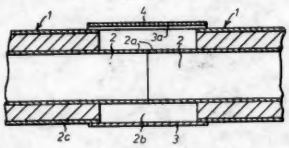
adjusting the guide means in accordance with the control signal so as to maintain the width of the film sheet material within a predetermined tolerance.

4,610,740

## METHOD FOR JOINING INSULATED CONDUITS

Urban Nordström, Bülowsvägen 20, S-237 00 Bjä. rred Sweden

Filed Apr. 26, 1985, Ser. No. 727,848
Claims priority, application Sweden, Apr. 30, 1984, 8402345
Int. Cl.[4] B32B 31/06
U.S. Cl. 156—79 3 Claims




1. A method for joining insulated conduits having an insulated exterior pipe, a medium carrying pipe generally concentric therewith and insulation between said pipe, with bare medium carrying pipe extending beyond said exterior pipe and insulation at the point where two such medium carrying pipes are joined, the method including the steps of:

applying a piece of resilient lengthwise slotted union over said bare pipes and over a portion of the exterior pipes;

bonding a moldable, curable strip onto said union along the entire length of said slot so as to generally seal the peripheral surface of the union,

injecting a foamable insulating material through said strip into the space between said union and said medium carrying pipes.

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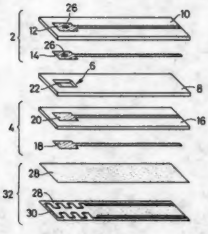
4,610,741

## PROCESS OF MANUFACTURING ELECTROCHEMICAL DEVICE

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 18, 1984, Ser. No. 683,139
Claims priority, application Japan, Dec. 24, 1983, 58-251675
Int. Cl.[4] C03B 29/00; C04B 33/34
U.S. Cl. 156—89 23 Claims




1. A process of manufacturing an electrochemical device including an electrochemical pumping cell having a first and a second electrode, and an electrochemical sensing cell having a third and a fourth electrode, such that the electrodes are disposed on at least one of a plurality of planar solid electrolyte bodies and such that the second and fourth electrodes are exposed to an internal cavity formed in an assembly of the pumping and sensing cells, the process comprising the steps of superposing unfired layers of the solid electrolyte bodies, which contain at least a thermally decomposable binder, on each other to form an unfired integral laminar structure with unfired layers of the electrodes disposed on at least one of the unfired layers of the solid electrolyte bodies such that the internal cavity is formed with a desired volume in said unfired integral laminar structure and such that the unfired layers of the second and fourth electrodes are exposed to the internal cavity, wherein the improvement comprises the steps of:

interposing an insert having a volume less than or equal to said desired volume into said internal cavity to be formed during the superposition of said unfired layers of the solid electrolyte bodies and electrodes into said unfired integral laminar structure, such that said insert is disposed opposite to exposed surfaces of said unfired layers of the second and fourth electrodes to prevent deformation of said internal cavity, said insert comprising a sublimable material which sublimes at a temperature above a decomposition temperature of said binder; and

co-firing said unfired integral laminar structure to sinter said laminar structure and result said sublimable material disappearing by means of sublimation.

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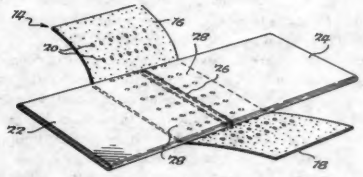
4,610,742

## METHODS AND MATERIALS FOR SPLICING TUBULAR FOOD CASINGS

Jaap Rop, BK Delfzijl, and Jacobus H. A. Verboekend, BE Appingedam, both of Netherlands, assignors to Teepak, Inc., Oak Brook, Ill.

Filed Nov. 15, 1984, Ser. No. 672,566
Int. Cl.[4] B65D 81/34; B65H 69/08
U.S. Cl. 156—158 14 Claims




1. A method of splicing premoisturized, ready-to-stuff tubular food casings, which comprises the steps of (a) assembling the trailing end of a moistened, ready-to-stuff first casing and the leading end of a moistened, ready-to-stuff second casing to form a joint, said ready-to-stuff casings having at leasat 20 percent by weight water based on total casing weight, (b) providing a splicing tape fabricated from a food film having a coating of a saran polymer, (c) wrapping the joint with the splicing tape, and (d) bonding the joint by compressing and heating the tape and moistened casing ends to a temperature sufficient to soften or melt the saran polymer without causing degradation.

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4,610,743

## PATTERN BONDING AND CREPING OF FIBROUS SUBSTRATES TO FORM LAMINATED PRODUCTS

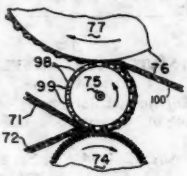
Nilo I. Salmeen, deceased, late of Neenah, Wis. (by Lorraine J. Salmeen, representative), and Bernard G. Klowak, Neenah, Wis., assignors to James River-Norwalk, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 182,833, Aug. 29, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,712
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] B31F 1/12, 1/14; B32B 7/14; D21H 5/24
U.S. Cl. 156—183 22 Claims

1. A process for producing a laminated paper product from multiple substrate webs, comprising the steps of:

(a) passing at least two highly bulked, low strength fibrous substrate webs, each having low internal fiber bonding such that the creping of the substrate will tend to separate and fluff up the fibers, into a nip between a gravure roller and an impression roller to form a laminate of the webs, the impression roller having a resilient surface with raised areas defining an interconnected network and depressed

areas between the raised areas such that the laminate of the webs is compressed under the raised areas of the impression roller and the remainder of the laminate is left substantially uncompressed, the height of the raised areas above the depressed areas selected to be greater than the uncompressed thickness of the substrate webs, the gravure roller having depressions which carry binding liquid in a pattern which underlies and registers with the raised areas on the impression roller such that binding liquid is absorbed substantially through the compressed areas of the laminate to bond together the substrate webs at these areas while the other areas of the laminate receive substantially no binding liquid;




(b) applying the laminate of the webs to a heated, moving, creping surface with a pressure roller having raised areas and depressed areas to define a pattern therein, the height of the raised areas above the depressed areas selected to be greater than the uncompressed thickness of the substrate webs, the laminate being compressed only by the raised areas of the pressure roller as it is applied to the creping surface and adhered thereto with the binding liquid coated side against the creping surface; and

(c) creping the laminate by removing it from the creping surface with a creping blade such that the bulk of the laminate so creped is greater than the sum of the individual bulks of the substrate webs.

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**4,610,744**

## HEAT TRANSFER PAD DECORATION AND SUBSTRATES THEREFORE

**Donald R. Smith, Hingham, and Mary G. Boyd, Framingham, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.**

**Continuation-in-part of Ser. No. 660,264, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 473,906, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 288,589, Jul. 30, 1981, Pat. No. 4,392,905. This application Sep. 9, 1985, Ser. No. 773,963**

**Int. Cl.**[4] **B32B** *31/00;* **B65C** *9/25;* **C09J** *5/06;* **A61F** *13/02*

**U.S. Cl. 156—235** **10 Claims**

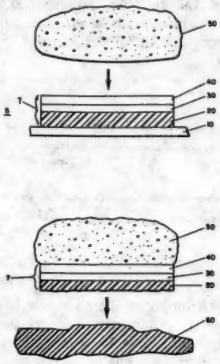
1. A process for transferring a decorative laminate from a support to an article, comprising the steps:

heating the laminate, which is comprised of a nonwax-based adhesive/release layer in contact with the support, and a design layer, to a first temperature above the melting point of said adhesive/release layer, said laminate not having a wax-based release layer intermediate said adhesive/release layer and the support;

heating the surface of an elastomeric member to a second temperature below said first temperature;

contacting the laminate under pressure with the heated elastomeric member so that the laminate adheres to the elastomeric member and separates from the support upon withdrawal of said elastomeric member;

impressing the laminate against the article to bond the adhesive/release layer thereto; and




withdrawing the elastomeric member from the article, whereupon the laminate remains permanently adhered to the article.

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**4,610,745**

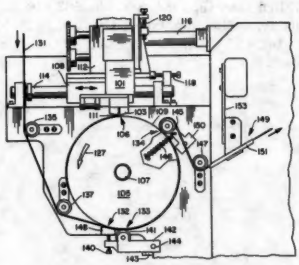
## METHOD AND APPARATUS FOR APPLYING HOT MELT PRESSURE SENSITIVE ADHESIVE TO A HEAT SENSITIVE WEB

**Lorry F. Sallee, Waushara County, and Russell E. Thorson, Outagamie County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Feb. 1, 1985, Ser. No. 697,315**

**Int. Cl.**[4] **B32B** *27/08*

**U.S. Cl. 156—244.11** **22 Claims**




1. Apparatus for applying a hot melt pressure sensitive adhesive to a web of heat sensitive material, comprising: means for heating and extruding said adhesive through an exit nozzle; a cooling transfer mechanism having a surface disposed adjacent to and spaced by a gap from said exit nozzle for receiving a substantially continuous bead of said adhesive from said nozzle; means for feeding said web of heat sensitive material into contact with said adhesive bead on said transfer mechanism surface; means for pressing said web against said adhesive bead and transfer mechanism surface; means for stripping said web and adhesive from said transfer mechanism surface; and means for spacing said exit nozzle from said cooling transfer mechanism surface during start-up and moving said exit nozzle toward said cooling transfer mechanism surface to form said gap after said exit nozzle has become heated.

16. A method of applying a hot melt adhesive to a web of heat sensitive material, comprising the steps of: spacing an exit nozzle from a cooling transfer mechanism surface during start-

up; moving said exit nozzle toward said cooling transfer mechanism surface to form a selected gap between said exit nozzle and said cooling transfer mechanism after said exit nozzle has become heated; heating, extruding through said exit nozzle and depositing said adhesive in a substantially continuous bead on a surface of said cooling transfer mechanism; causing said adhesive bead to cool substantially uniformly across its width; bringing a substantially continuous web of heat sensitive material into contact with said adhesive bead after it has cooled sufficiently to prevent adverse reaction with the heat sensitive material; pressing said web into intimate contact with said adhesive bead on said transfer mechanism surface; and stripping said web and adhesive from said transfer mechanism surface.

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4,610,746

## METHOD OF OPTICALLY CONNECTING A LIGHT CONDUCTOR TO AN ELECTRO-OPTICAL DEVICE

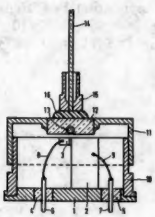
**Dirk J. Broer, and Johan C. J. Finck, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 27, 1983, Ser. No. 565,563**

**Claims priority, application Netherlands, Sep. 22, 1983, 8303251**

**Int. Cl.⁴ B32B *31/00***

**U.S. Cl. 156—275.5** **14 Claims**



1. A method of optically connecting a light conductor to an electro-optical device by means of a curable composition, characterized in that the curable composition comprises from 40 to 95% by weight of at least one oligomer selected from the group of oligomeric acrylates, which composition furthermore comprises from 0.5 to 5% by weight of a heat- or light-activatable initiator, the refractive index of the connecting material which is reached after curing being adjusted by the addition of from 2 to 30% by weight of a reactive diluent which has a refractive index-increasing influence and from 2 to 30% by weight of a reactive diluent which has a refractive index-decreasing influence, said curable composition being contacted with the light conductor and the electro-optical device and after mutual positioning of the light conductor and the electro-optical device being cured by means of a rise in the temperature or by exposure to light.

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4,610,747

## PROCESS FOR STEPWISE HEATING UP METALLIC STRIPS OR FOILS

**René Bregenzer, Neuhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland**

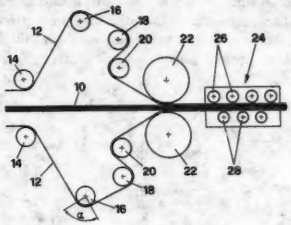
**Filed Mar. 18, 1985, Ser. No. 712,519**

**Claims priority, application Switzerland, Mar. 23, 1984, 1476/84**

**Int. Cl.⁴ B32B *31/08***

**U.S. Cl. 156—322** **10 Claims**

1. A process for the stepwise heating of a metallic strip having a width of at least 800 mm so as to prevent the formation of wrinkles on said strip to a final temperature of about between 100° to 300° C. comprising providing a plurality of rolls, arranging said plurality of rolls such that said metallic strip is deflected over each of said plurality of rolls at an angle of about between 60 to 120 degrees, heating said plurality of rolls such that the temperature of said plurality of rolls increases in the direction of metallic strip throughput from about




between 20° to 70° C. from roll to roll wherein the last of said plurality of rolls is heated to the desired final temperature of said metallic strip, and passing said metallic strip having a width of at least 800 mm over said plurality of rolls.

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4,610,748

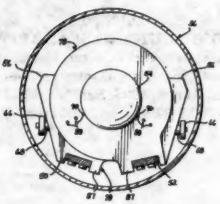
## APPARATUS FOR PROCESSING SEMICONDUCTOR WAFERS OR THE LIKE

**George M. Engle, Scottsdale, and Richard S. Rosler, Paradise Valley, both of Ariz., assignors to Advanced Semiconductor Materials of America, Inc., Phoenix, Ariz.**

**Filed Dec. 10, 1984, Ser. No. 679,898**

**Int. Cl.⁴ B44C *1/22*; C23F *1/00*; C23C *14/00*; B05B *5/02***

**U.S. Cl. 156—345** **4 Claims**



1. In a chemical vapor processing apparatus for processing workpices within an evacuable envelope for containing the chemical vapor and workpieces, a boat assembly removably insertable within the envelope, comprising:

a plurality of electrically conductive disk plate members, and disk plate members being interleaved with respect to each other;

holding means for rigidly holding said interleaved disk plate members and electrically isolating adjacent ones of said disk plate members;

conductor means for applying an alternating energy to said disk plate members when energized; and

variably holding means for holding variable size workpieces onto each of said disk plate members.

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4,610,749

## DUCT FORMING MACHINE STRIP MATERIAL ALIGNMENT COMPENSATING SYSTEM

**Ramon R. Barreto, Burbank, Calif., assignor to Serpentine Corporation, San Fernando, Calif.**

**Filed May 16, 1985, Ser. No. 735,077**

**Int. Cl.⁴ B65H *81/00***

**U.S. Cl. 156—429** **13 Claims**

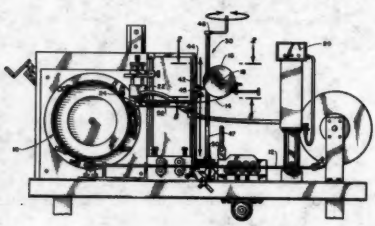
1. In a duct forming machine having reinforcing wire and strip material fed to a rotating mandrel with the strip material

overlapping and encapsulating the reinforcing wire the improvement comprising:

a spool of flexible strip material rotatably mounted on an axle being fed to said duct forming machine mandrel;

platform mounting means for mounting said axle;

vertical adjustment means for adjusting the vertical position of said platform mounting means to align said strip material with respect to said rotating mandrel;



horizontal adjusting means for adjusting the horizontal position of said axle on said platform mounting means to align said spool with respect to said rotating mandrel; and

horizontal angular adjustment means for adjusting the horizontal angular position of said axle with respect to said mandrel;

whereby alignment of said spool with said mandrel may be easily made by adjusting said platform mounting means vertically and adjusting the horizontal and angular position of said axle mounted on said platform.

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**4,610,750**

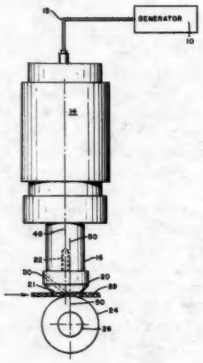
## ULTRASONIC CUT AND SEAL APPARATUS

**Carmine M. Mango, Brookfield Center, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.**

**Filed Apr. 5, 1985, Ser. No. 720,133**

**Int. Cl.[4] B29C *65/08;* B32B *31/18***

**U.S. Cl. 156—510** **5 Claims**




1. An ultrasonic cut and seal apparatus including an elongated resonator dimensioned to be resonant as a half wavelength resonator for energy of predetermined frequency for providing ultrasonic energy manifest at a planar output surface thereof to a workpiece in contact with said output surface; an anvil disposed opposite said output surface and having a cutting surface and at least one adjacent sealing surface, whereby sheet material fed between said output surface and said anvil is cut and sealed in a marginal region adjacent to the cut in response to being exposed to ultrasonic energy provided by said output surface, the improvement comprising:

said resonator including a bore extending from the side of said resonator angularly inclined relative to the longitudinal axis of said resonator to said output surface for feeding a thermoplastic filament adapted to melt and fuse with the sheet material from a location outside said resonator into the area between said output surface and the sheet material;

the longitudinal axis of said resonator being displaced from the point of maximum compression effective upon sheet material interposed between said anvil and said output surface, and

said bore, resonator and anvil being arranged relative to one another to cause the filament to be fed upon the sheet material before the sheet material is cut and the filament is fused with the sheet material.

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**4,610,751**

## APPARATUS FOR SEPARATING AND APPLYING OF SECTIONS OF STRIPS ON AREAS OF A MATERIAL WEB LYING AT A DISTANCE ONE BEHIND THE OTHER

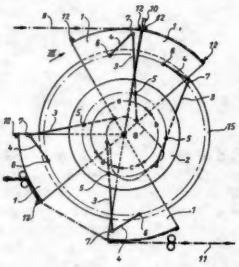
**Dieter Eschler, Heidenheim, Fed. Rep. of Germany, assignor to Paul Hartmann Aktiengesellschaft, Heidenheim, Fed. Rep. of Germany**

**Filed Oct. 22, 1984, Ser. No. 663,374**

**Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338306; Aug. 30, 1984, 3432910**

**Int. Cl.[4] B32B *31/04, 31/18***

**U.S. Cl. 156—517** **6 Claims**



1. An apparatus for separation of elastically extended strip sections from a first moving material web for the subsequent application of the strip sections to discrete areas lying at a predetermined distance one behind the other of a likewise moving second material web in the case of which each strip section just separated away from a subsequent strip section for such a length of time until the predetermined distance between them has been reached, wherein it is then moved over a distance corresponding at least to a length of the strip at a constant speed and at the same time it is completely transferred to the second material web, wherein a plurality of conveying elements rotate on an axle with a rotating receiving surface and one of said conveying elements lying on an equal circular circumference is capable of being put against two material webs one lying behind the other, the conveying elements have a predetermined distance in relation to one another and vary per rotation of their angular speed in such a way that in a first fixedly predetermined position in which the first material web is put onto the receiving surfaces of the conveying elements, so that two conveying elements lie one behind the other at a minimal distance, from which the conveying element which is the forward one in a direction of movement departs while increasing the distance, at an angular speed greater as compared to the adjacent, following conveying element, and after reaching a distance in which the strip sections carried along are

to be applied to the second material web, transfer the strip sections in a second, fixedly predetermined position to the second material web, the apparatus comprising:

a driving disc which rotates on the axle of the conveying element;

a first lever which is mounted rotatable in an axle on a graduated circle of said driving disc parallel to the axle of the conveying elements;

a radially inner end of said first lever is guidable on a predetermined curved path;

a second lever articulated at a radially outer end of said first lever;

said second levers being articulately connected with said conveying element;

the points of articulation for said second levers lie at the same place on each conveying element; and

said curved path being designed such that said second levers counting from their pertinent point of articulation on said conveying element change their angle in relation to the graduated circle on which these points of articulation lie in order to achieve variable speeds of said conveying elements during one rotation.

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**4,610,752**

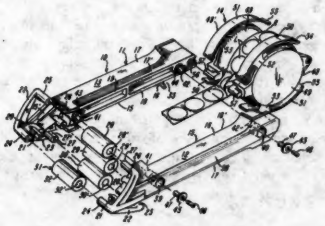
## HAND-HELD LABELER

**Gregory B. Arnold, Stamford, Conn., assignor to Monarch Marking Systems, Inc., Dayton, Ohio**

**Filed Jun. 29, 1983, Ser. No. 508,450**

**Int. Cl.[4] B44C *7/00, 7/08, 1/16***

**U.S. Cl. 156—540** **6 Claims**



**1. A hand-held labeler for applying labels releasably adhered to a carrier web, comprising: a labeler body, means on the body for successively delaminating labels from the carrier web, means for applying labels, means for advancing the carrier web to effect label delamination, the labeler body having a first-type connector portion, a handle having a first-type connector portion and a second-type connector portion, a label roll holder for holding a label supply roll and having a second-type connector portion, the second-type connector portion of the handle being adapted to be connected to the first-type connector portion of the labeler body, and the second-type connector portion of the label roll holder being adapted to be connected either to the first-type connector portion of the handle or to the first-type connector portion of the labeler body.**

**4,610,753**

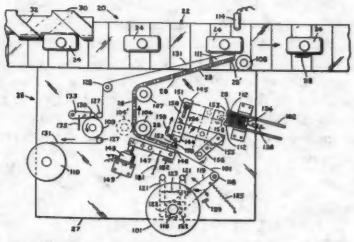
## LITERATURE APPLYING MECHANISM

**Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and Edward J. Mazur, Montville, all of N.J., assignors to NJM, Inc., Fairfield, N.J.**

**Continuation-in-part of Ser. No. 628,761, Jul. 9, 1984, Pat. No. 4,555,299, which is a continuation-in-part of Ser. No. 542,731, Oct. 17, 1983, Pat. No. 4,502,910. This application Jul. 5, 1985, Ser. No. 752,131**

**Int. Cl.[4] B32B *31/04***

**U.S. Cl. 156—552** **5 Claims**



**1. A system for applying a piece of literature to an object, said system comprising:**

**means for pressing the piece of literature against the object;**

**a hopper for storing pieces of literature;**

**means for moving a tape having an adhesive coating to said pressing means;**

**suction cup means movable between a first position in which said suction cup means picks up, by a vacuum, the piece of literature from said hopper and a second position in which said suction cup means delivers said piece of literature onto said adhesive coating of said tape and said vacuum is terminated; and**

**stationary means disposed adjacent said second position for urging said tape toward said suction cup means and against said piece of literature as said suction cup means deliver said piece of literature onto said adhesive coating of said tape.**

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**4,610,754**

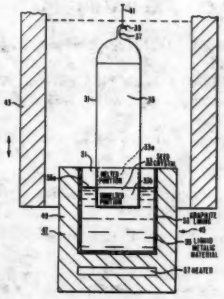
## METHOD FOR GROWING CRYSTALS

**Walter E. Gaida, East Pittsburgh, and Zoltan K. Kun, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Division of Ser. No. 437,779, Oct. 29, 1982, Pat. No. 4,540,550. This application Jun. 4, 1984, Ser. No. 617,059**

**Int. Cl.[4] C30B *11/14***

**U.S. Cl. 156—601** **6 Claims**



**2. In a crystal growth process utilizing a seed crystal having**

a first portion and a second portion, a method for maintaining the first portion of the seed crystal below the melting temperature thereof during the crystal growth process which process includes the melting of the second portion of the seed crystal and a charge of crystal growth material in contact with the second portion of the seed crystal in a growth vessel; said method comprising the steps of:

substantially surrounding a portion of the growth vessel containing the seed crystal first portion in a substantially liquid metallic-material wherein said substantially liquid metallic-material is in intimate contact with the aforesaid growth vessel portion, the second portion of the seed crystal and the crystal growth material being disposed beyond the surface of said metallic material; and

maintaining said metallic material at a temperature lower than the melting temperature of the seed crystal, said metallic material effecting sufficient heat transfer from the seed crystal first portion below the surface of said metallic material to cause said seed crystal first portion to remain unmelted during the melting of the second portion and the crystal growth material.

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**4,610,755**

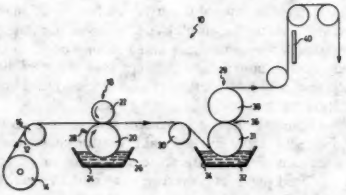
## DEMETALLIZING METHOD

**Donald E. Beckett, 963 Tennyson Ave., Mississauga, Ontario, Canada (L5H 2Y9)**

**Filed Apr. 16, 1985, Ser. No. 723,909**

**Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06***

**U.S. Cl. 156—634** **13 Claims**



1. A method of forming a pattern on a metallized film, which comprises:

printing onto the metallized surface of the film a pattern of a water-based varnish having an etchant dissolved therein,

permitting said pattern to remain in contact with the metallized surface for a period of time sufficient to etch said pattern into the metallized surface,

washing spent etchant from said film, and

drying the resulting washed film.

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**4,610,756**

## PRINTED CIRCUIT BOARD AND PROCESS FOR ITS MANUFACTURE

**Jean-Paul Strobel, Avully, Switzerland, assignor to Cirtech S.A., Switzerland**

**Filed Jul. 13, 1983, Ser. No. 513,337**

**Claims priority, application Switzerland, Jul. 16, 1982, 4352/82**

**Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06***

**U.S. Cl. 156—645** **11 Claims**

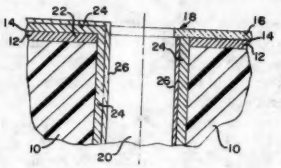
1. A method for making a printed circuit board by masking and etching, comprising the following steps:

(1) providing a flat, clean circuit board consisting of insulating material and copper clad on at least one of its major surfaces,

(2) drilling, according to a desired and predeterminated pattern, perfect and precise through holes in said board,

(3) metallization of at least the inner wall of the drilled holes, to deposit a thin metal lining,

(4) masking of the circuit board surface or surfaces by a mask showing a predeterminated circuit pattern, the mask overlapping the edges of the drilled holes,



(5) applying an etching resist on the so masked circuit board, and

(6) etching the circuit.

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**4,610,757**

## METHOD OF MANUFACTURING A GRATING

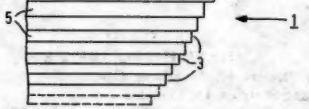
**Giok D. Khoe, and Antonius J. A. Nicia, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 13, 1984, Ser. No. 671,152**

**Claims priority, application Netherlands, Nov. 15, 1983, 8303906**

**Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06***

**U.S. Cl. 156—655** **11 Claims**



1. A method of manufacturing an optical grating, said method comprising the steps of:

providing a substrate having a surface;

depositing a number of layers of material on the surface of the substrate, said layers having substantially equal thicknesses, said layers forming a substantially planar etch surface substantially perpendicular to the surface of the substrate and substantially perpendicular to the layers; and

etching the planar etch surface with an etchant;

characterized in that each layer of the etch surface is etched by the etchant at a rate which is proportional to the distance of the layer from the substrate so as to form a non-periodic stepped surface.

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**4,610,758**

## MANUFACTURE OF PRINTED CIRCUIT BOARDS

**Geoffrey C. Wilson, Reading, England, assignor to Ferranti plc, Cheshire, England**

**Filed May 30, 1984, Ser. No. 615,261**

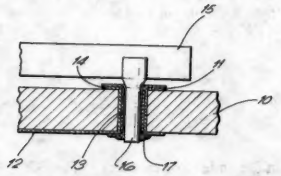
**Claims priority, application United Kingdom, Jun. 1, 1983, 8315010**

**Int. Cl.⁴ B05D *5/12*; C23F *1/02***

**U.S. Cl. 156—656** **7 Claims**

1. A method of manufacture of a printed circuit board adapted to have components soldered thereto and having plated through holes interconnecting printed conductors formed on each of two external surfaces, which enables ready removal of soldered components having portions thereof received in the plated through holes of the printed circuit board, said method including the steps of masking those areas of the external surfaces where solder will be required to adhere when

a component is soldered to the printed circuit board, coating unmasked conductive areas with a material which prevents wetting by normal soldering techniques, and subsequently removing the masking material so that components can be soldered to the printed circuit board at the areas which were masked during said masking step, said areas which were masked during said masking step each being located on one of




the surfaces of the printed circuit board adjacent to the periphery of the bore of a said plated through hole and said coating material being applied to the bore of the plated through holes whereby components which are soldered to the printing circuit board at the areas that were masked during said masking step and which have portions thereof received in said plated through holes can be readily removed.

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**4,610,759**

## ETCHING SOLUTION FOR AND METHOD OF ETCHING FERRIMAGNETIC GARNET COMPOUNDS

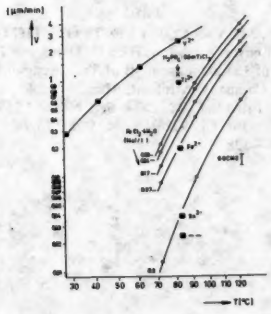
**Claus P. Klages, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed May 3, 1985, Ser. No. 730,221**

**Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3416991**

**Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06***

**U.S. Cl. 156—662** **9 Claims**




1. An etching solution comprising at least one strong mineral acid for etching ferrimagnetic garnet compounds, characterized in that it comprises additionally one- or two-electron donors as a reducing agent.

9. A method of etching ferrimagnetic garnet compounds while using the etching solution as claimed in claim 1, characterized in that etching is carried out at an etching temperature in the range from 20° to 120° C.

**4,610,760**

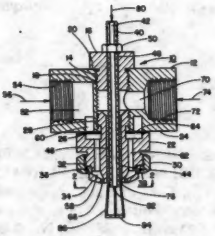
## THREE-FLUID ATOMIZING NOZZLE AND METHOD OF UTILIZATION THEREOF

**Paul A. Kirkpatrick, Jackson; Marvin Schulman; Douglas M. Lehmann, both of Howell, and Joseph L. Hegadorn, Ridgewood, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Aug. 24, 1984, Ser. No. 643,925**

**Int. Cl.[4] B01D *1/18***

**U.S. Cl. 159—4.01** **15 Claims**



1. An arrangement for the atomization and spray-drying of a viscous liquid including a three-fluid atomizing nozzle having separate dispensing orifices for the downward discharge of three fluids, comprising:

(a) a three-fluid nozzle including an inner circular orifice for downwardly dispensing a flow of pressurized steam from said nozzle; a middle annular dispensing orifice concentrically encompassing said inner orifice for downwardly discharging a flow of a viscous liquid from said nozzle; and an outer annular dispensing orifice concentrically encompassing said middle annular dispensing orifice for downwardly discharging a flow of a pressurized air, said three orifices outer being positioned to preclude mixing of the inner steam or air flows with the viscous liquid within said nozzle and to effect an initial atomization of said viscous liquid by the steam flow externally of said nozzle;

(b) a circular deflector plate supported from said nozzle downstream of said dispensing orifices, said deflector plate extending transversely across the path of the steam and initially atomized viscous liquid and having a diameter at least as large as the diameter of the middle annular dispensing orifice to cause the steam and the initially atomized viscous liquid to impinge thereagainst and to be deflected in substantially radially outward directions, the downwardly directed flow of pressurized air from the outer annular orifice closely bypassing the outer circumference of said deflector plate and impinging against the radially outward flow of the steam and initially atomized liquid to thereby deflect the flow thereof into a generally downward flow path and to further atomize the liquid stream; and

(c) a spray-drying tower for supplying a stream of heated air to contact and dry the further atomized particles.

4,610,761

## PAPER THAT CONTAINS CHEMICALLY SUBSTITUTED CELLULOSE

Dan Eklund, Grankulla; Jukka Erkkilä; Matti Ingman, both of Säkylä ; Anders Lassus, Åbo; Kauko Peltonen, and Kari Saarinen, both of Säkylä, all of Finland, assignors to Lännen Tehtaat Oy, Iso-Vimma, Finland

PCT No. PCT/FI84/00040, § 371 Date Dec. 19, 1984, § 102(e) Date Dec. 19, 1984, PCT Pub. No. WO84/04553, PCT Pub. Date Nov. 22, 1984

PCT Filed May 21, 1984, Ser. No. 691,564

Claims priority, application Finland, May 19, 1983, 831767

Int. Cl.[4] D21H *5/12*

U.S. Cl. 162—157.6 14 Claims

1. Paper comprising a conifer cellulose fibre substituted by means of an N-methylol compound which is a reaction product of urea, glyoxal, and formaldehyde and which is selected from the group consisting of monomethylol-di-hydroxyethyleneurea and dimethylol-di-hydroxyethyleneurea.

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4,610,762

## METHOD FOR FORMING POLYMER FILMS HAVING BUBBLE RELEASE SURFACES

Jeffrey D. Birdwell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1985, Ser. No. 739,933

Int. Cl.[4] C25G *1/14*

U.S. Cl. 204—1 R 55 Claims

1. A method for forming polymer films having a roughened surface using removal substrates comprising:

(a) providing a removable substrate with a roughened surface;

(b) forming a dispersion of a perfluorinated polymer containing sites convertible to ion exchange groups and a dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands;

(c) depositing the dispersion onto the roughened, removable substrate;

(d) removing the dispersant from the dispersion; and

(e) removing the substrate.

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4,610,763

## ELECTRODEPOSITION OF CHROMIUM AND CHROMIUM BEARING ALLOYS

Malcolm J. Law, Dorking, United Kingdom, assignor to Inter Metals and Minerals, S.A., Panama, Panama

PCT No. PCT/GB85/00135, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/04677, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 1, 1985, Ser. No. 759,611

Claims priority, application United Kingdom, Apr. 7, 1984, 8409073

Int. Cl.[4] C25D *3/56, 5/12, 5/48*

U.S. Cl. 204—35.1 8 Claims

1. A method of coating a substrate wherein it is provided with a nickel coating upon which is electrodeposited an alloy consisting of 51 to 75% chromium, 5 to 15% nickel and/or cobalt and balance iron.

8. A method as claimed in claim 1 wherein the coated substrate is treated in a solution of potassium or sodium dichromate at pH 3–5, a temperature of 30°–50°, at 30–50 amps/sq. ft.

4,610,764

## ELECTROLYTIC CATION EXCHANGE MEMBRANE

Tatsuro Asawa; Haruhisa Miyake, and Yoshio Sugaya, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 577,807, Feb. 7, 1984, abandoned. This application May 20, 1985, Ser. No. 735,714

Int. Cl.[4] C25B *1/34, 13/00*

U.S. Cl. 204—98 16 Claims

16. An electrolytic cation exchange membrane which consists of a first film made of a fluorinated polymer having the following repeating units (a) and (b):

(a) $-(CF_2-(CXX')-$

(b) $+CF_2-CX+$ with $Y-A$ attached to CX

wherein:

X and X' independently represent —F, —Cl, —H or $CH_3$;

A is —COOM or $-PO_3M_2$, wherein M is hydrogen, an alkali metal ion, or a group hydrolyzable to an alkali metal ion; and

Y is selected from the group consisting of $-(CF_2)_x-$, $-O-(CF_2)_x-$,

$-(O-CF_2-CF)_x-$ (Z) and $-(O-CF-CF_2)_x-O-(CF)_y-$ (Z, Z);

wherein

Z is —F or a perfluoroalkyl group having from 1 to 10 carbon atoms; and

each of x and y is an integer of from 1 to 10,

wherein said first film contains a fibrillated tetrafluoroethylene polymer, and

a second film laminated thereon, made of a fluorinated polymer having carboxylic acid groups as its ion exchange groups;

said first film having a greater thickness and smaller specific electric resistance than said second film wherein said first film has a thickness of from 50 to 500 μm, said second film has a thickness of from 5 to 50 μm, and the ratio of the thickness of said first film to the thickness of said second film is within a range of from 2 to 50.

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4,610,765

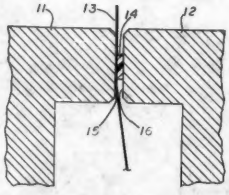
## SEAL MEANS FOR ELECTROLYTIC CELLS

Richard N. Beaver, Angleton; Hiep D. Dang, and H. Gene Newton, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 24, 1984, Ser. No. 653,257

Int. Cl.[4] C25B *1/26, 9/00, 13/02*

U.S. Cl. 204—128 28 Claims




24. A method of electrolysis comprising:

(a) feeding an aqueous alkali metal halide solution to an electrolytic cell having at least a first frame member, a second frame member, a separator interposed between the first and second frame members to space apart an anode and a cathode, and a pre-compressed seal means inter-

posed between at least the first or second frame member and the separator, and

(b) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

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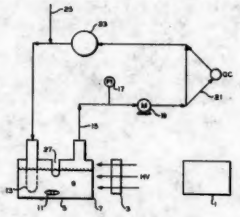
## 4,610,766
## PHOTOCHEMICAL PRODUCTION OF HYDROGEN FROM HYDROGEN SULFIDE

**John H. Kolts; Joseph E. Figard; James B. Kimble, and Donald H. Kubicek, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 11, 1985, Ser. No. 743,547**
**Int. Cl.[4] B01J *19/12***
**U.S. Cl. 204—157.52** **8 Claims**



1. A method for producing $H_2$ and $H_2S$ comprising:

(1) dissolving $H_2S$ in in an alkaline liquid medium to provide a composition consisting essentially of $H_2S$ dissolved in an alkaline liquid medium, and

(2) irradiating said composition consisting essentially of $H_2S$ dissolved in said alkaline liquid medium with light in the visible range.

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## 4,610,767
## PHOTOCHEMICAL METHOD FOR PREPARING 4-KETO-9-METHYLPHENAZINE

**Andrei K. Zhagars; Voldemar Y. Grinshtein, and Nikolai B. Novak, all of Riga, U.S.S.R., assignors to Latviisky Gosudarstvenny Universitet Imeni P.Stuchki, Riga, U.S.S.R.**

**Filed May 8, 1985, Ser. No. 731,838**
**Int. Cl.[4] B01J *19/12***
**U.S. Cl. 204—157.81** **2 Claims**

1. A method for preparing 4-keto-9-methylphenazine, comprising methylation of phenazine with dimethylsulphate, followed by keeping the reaction mixture at a temperature within the range of from 0° to 10° C. and conducting a photochemical oxidation of the resulting 9-methylphenazinium methylsulphate by UV-radiation for not longer than 3 hours, bringing the pH of the reaction medium to 8.5–9.5, a repeated irradiation thereof for 3–5 hours, and isolation of the desired product.

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## 4,610,768
## LACTAM PURIFICATION

**Seid H. Moosavian, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio**

**Filed Dec. 2, 1985, Ser. No. 803,752**
**Int. Cl.[4] B01B *3/36*; C07D *201/16***
**U.S. Cl. 203—14** **13 Claims**

1. A process for drying unsubstituted 5–12-membered ring lactams comprising the steps of:

(a) mixing (i) lactam with (ii) at least one hydrocarbon of 5–12 carbon atoms to form a mixture;

(b) distilling said hydrocarbon from the misture to produce a water/hydrocarbon-containing vapor and/or water/hydrocarbon-containing condensate;

(c) contacting said vapor and/or condensate with a drying agent so that water is removed from it;

(d) returning the dried distillate to the mixture;

(e) repeating steps (b)–(d) until the water content of the lactam/hydrocarbon mixture is less than about 50 ppm water;

(f) recovering the lactam in a dried form having a water content less than about 50 ppm water.

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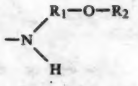
## 4,610,769
## METHOD OF ELECTRODEPOSITION EMPLOYING LOW TEMPERATURE AMINOPLAST CURABLE CATIONIC ELECTRODEPOSITABLE COATING COMPOSITIONS

**Joseph F. Bosso, Lower Burrell, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 495,306, May 16, 1983, Pat. No. 4,501,833.**
**This application Oct. 9, 1984, Ser. No. 658,725**
**Int. Cl.[4] C25D *13/06*; C08L *63/00***
**U.S. Cl. 204—181.7** **14 Claims**

1. An improved method of coating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode and an anode immersed in an aqueous dispersion of a curable cationic electrodepositable coating composition an onium group-containing polymer and an aminoplast curing agent, said method comprising passing electric current between the cathode and the anode in an amount sufficient to cause the electrodepositable composition to deposit as a coating on the cathode and heating the coated article at a temperature sufficient to cure the coating, characterized in that at least 15 percent by weight of the aminoplast is a condensate of an amine or an amide with a stoichiometric deficiency of an aldehyde or a ketone and wherein the aminoplast has at least one group of the structure:



wherein $R_1$ is carbon derived from the aldehyde or a ketone, $R_2$ is hydrogen or alkyl, and the aminoplast is present in amounts sufficient to cure the composition.

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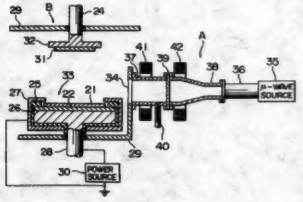
## 4,610,770
## METHOD AND APPARATUS FOR SPUTTERING

**Hiroshi Saito; Hideki Tateishi, both of Yokohama; Shigeru Kobayashi, Tokyo; Susumu Aiuchi; Yasumichi Suzuki, both of Yokohama; Masao Sakata; Hideaki Shimamura, both of Yokohama, and Tsuneaki Kamei, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 24, 1984, Ser. No. 686,005**
**Claims priority, application Japan, Dec. 26, 1983, 58-243870**
**Int. Cl.[4] C23C *15/00***
**U.S. Cl. 204—192.1** **24 Claims**




1. In a method for sputtering including disposing an electrode structure carrying a planar target opposite to a substrate and causing sputtering of the target material from said target by the action of plasma for deposition of a thin film on the

surface of said substrate, said method further comprising the steps of:

introducing microwaves to said planar target placed under a predetermined pressure condition in a processing chamber, with a surface of said planar target being opposed to a surface of said substrate on which said thin film is to be sputtered, said microwaves being introduced from a direction along said surface of said target;

maintaining said plasma in an area above the surface of said target, using the microwaves and magnetic fields defined with magnet means; and

accelerating ions in said plasma toward and onto the surface of said target by the action of an electric field established by said electrode structure to cause impingement of the ions against the surface of said target thereby causing said sputtering of the target material from said target for deposition of the film on the surface of said substrate.

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**4,610,771**

## SPUTTERED FILMS OF METAL ALLOY OXIDES AND METHOD OF PREPARATION THEREOF

**F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 29, 1984, Ser. No. 665,680**

**Int. Cl.[4] C23C *14/08, 14/34***

**U.S. Cl. 204—192.1** **20 Claims**

16. A method for making a multiple layer high transmittance, low emissivity coated product comprising the steps of:

a. placing a transparent, nonmetallic substrate in a sputtering chamber;

b. sputtering a cathode target comprising an alloy of zinc and tin in a reactive atmosphere comprising oxygen to deposit a transparent metal alloy oxide film on a surface of said substrate;

c. sputtering a silver cathode target, in an inert atmosphere to deposit a transparent silver film on said metal alloy oxide film; and

d. sputtering a cathode target comprising an alloy of zinc and tin in a reactive atmosphere comprising oxygen to deposit a metal alloy oxide film on said silver film.

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**4,610,772**

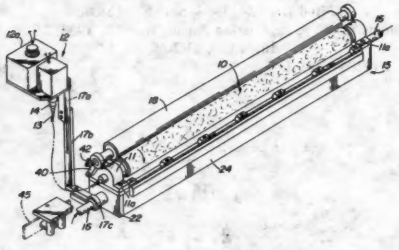
## ELECTROLYTIC PLATING APPARATUS

**Karl Palnik, Huntingdon Valley, Pa., assignor to The Carolinch Company, Ivyland, Pa.**

**Filed Jul. 22, 1985, Ser. No. 757,794**

**Int. Cl.[4] C25D *17/00, 17/28***

**U.S. Cl. 204—206** **10 Claims**



1. Apparatus for rotary brush plating of metal parts comprising: a rotatably mounted cylindrical body, said body being comprised of a hydrophobic material and having interconnected pores substantially uniformly dispersed throughout, extending radially outwardly to the periphery, said body further having a centrally located distribution conduit extending lengthwise thereof; a reservoir of plating solution; means for delivering plating solution under pressure from said reservoir to said distribution conduit and from the distribution conduit radially outwardly through the pores to the periphery of said body, positively-charged anodic means for imparting positive charge to the plating solution on the periphery of said body, means for rotating said body; and means for passing said parts along a path extending lengthwise of the body with the part surface to be plated in contact with the periphery of the rotating body.

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**4,610,773**

## IMMERSION TYPE ELECTRODE STRUCTURE

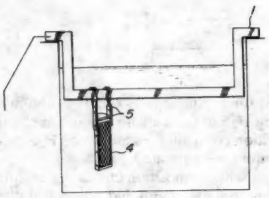
**Teruko Takayasu, Nagoya, Japan, assignor to Showa Entetsu Co., Ltd., Nagoya, Japan**

**Continuation of Ser. No. 636,358, Jul. 31, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 768,933**

**Claims priority, application Japan, Feb. 5, 1983, 59-121257[U]**

**Int. Cl.[4] C25B *11/03*; C25C *7/02***

**U.S. Cl. 204—285** **3 Claims**




1. An immersion type electrode structure for an electroplating bath, comprising:

a power supply bus bar completely covered with a thin layer of corrosion-resistant metal and having an upper and a lower portion;

means for suspending said bus bar by said upper portion such that said lower portion is completely immersed in the electroplating bath; and

anode means completely covered with a thin layer of a corrosion-resistant metal and having a current supply hanger portion of a main body portion, said anode means being supported in said electroplating bath by hanging from said lower portion of said bus bar by said hanger portion and power being supplied to said anode means from said bus bar through the hanger portion.

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**4,610,774**

## TARGET FOR SPUTTERING

**Masao Sakata, Yokohama; Shigeru Kobayashi, Tokyo; Katsuo Abe, Yokosuka; Hideaki Shimamura, Yokohama; Tsuneaki Kamei, Kanagawa; Osamu Kasahara, Tokyo; Hidetsugu Ogishi, Hachioji, and Takeshi Oyamada, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 14, 1985, Ser. No. 797,993**

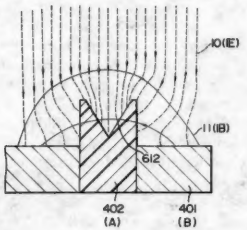
**Claims priority, application Japan, Nov. 14, 1984, 59-238355; Nov. 14, 1984, 59-238356**

**Int. Cl.[4] C23C *15/00***

**U.S. Cl. 204—298** **7 Claims**

1. A target for sputtering based on magnetron discharge having a plurality of annular target members arranged concentrically with respect to a rotational symmetry axis, said target comprising:

at least one of annular projection projecting beyond a surface of a target member, forming a repellent face of electron and annular recess provided for a target member, for concentration of an electric field.

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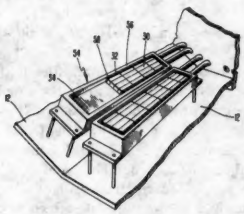
4,610,775

## METHOD AND APPARATUS FOR CLEARING SHORT-CIRCUITED, HIGH-VOLTAGE CATHODES IN A SPUTTERING CHAMBER

Clarence G. Phifer, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1985, Ser. No. 759,381
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 30 Claims



1. In a sputtering chamber having at least one cathode assembly energized by a dc power source, a shorting flake evaporation device comprising:

a first switching means for connecting said dc power source to said cathode assembly;

an auxiliary power source;

a second switching means for connecting said auxiliary power source to said cathode assembly;

means for controlling said first and second switching means to selectively connect one of said dc power source and said auxiliary power source to said cathode assembly.

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4,610,776

## COAL LIQUEFACTION PROCESS

Peter Urban, Northbrook, and Lee Hilfman, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 626,810, Jun. 29, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 754,718
Int. Cl.[4] C10G *1/06, 1/00, 47/02, 11/00*
U.S. Cl. 208—418 17 Claims

1. A coal liquefaction process comprising reacting coal with a hydrocarbonaceous solvent at coal liquefaction conditions in the presence of an oil shale residue catalyst comprising organic and inorganic fractions, said catalyst being produced by the treatment of oil shale in the presence of an inert gas at a temperature in the range from about 500° F. to about 825° F. and at a pressure in the range of from about atmospheric to about 2000 psig for a period of time of from about 0.1 to 10 hours.

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4,610,777

## COAL LIQUEFACTION WITH MN NODULES

Philip Varghese, Newtown, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1984, Ser. No. 641,096
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—417 20 Claims

1. A one-stage method for the liquefaction of coal under liquefaction conditions in the presence of manganese nodules in combination with an improved coal liquefaction solvent containing polycondensed aromatic systems or components possessing polarographic reduction potentials of about −1.0 to about −2.0 volts comprising the steps of:

(a) reacting said coal with hydrogen in the presence of a catalyst comprising manganese nodules, and a solvent containing substantially those polycondensed aromatic systems or components that possess polarographic reduction potentials of about −1.0 to about −2.0 which produces substantially larger proportions of hydrogen donors with substantially greater coal conversion effectiveness than does pre-hydrotreating said coal solvent;

(b) conducting the reaction at a temperature of at least about 500° F. and at a pressure of at least about 1000 psig; and

(c) recovering the resulting hydrocarbonaceous components obtained therefrom.

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4,610,778

## TWO-STAGE HYDROCARBON DEWAXING PROCESS

Richard G. Graven, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 481,504, Apr. 1, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 741,023
Int. Cl.[4] C10G *47/16*
U.S. Cl. 208—89 15 Claims

1. A process for catalytically dewaxing and hydrotreating a waxy hydrocarbon fraction to provide a lubricating oil of high viscosity index which comprises passing a sulfur containing fraction through a severe lube hydrotreating process step to produce an effluent which is relatively low in sulfur, adding a sulfur compound and contacting the effluent and said sulfur compound with a dewaxing catalyst under conditions sufficient to effect at least a partial dewaxing of the effluent and contacting the reaction product thereby obtained in a hydrofinishing reactor in the presence of said added sulfur compound with hydrogen and a hydrofinishing catalyst comprising at least one Group VIA or VIIIA metal, metal oxide or metal sulfide, said sulfur compound being added in an amount so as to provide about 20 to about 250 ppm by weight of sulfur in the hydrofinishing reactor based on the weight of the feed in the hydrofinishing reactor.

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4,610,779

## PROCESS FOR THE HYDROGENATION OF AROMATIC HYDROCARBONS

Gerald E. Markley, and James C. Spry, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 5, 1984, Ser. No. 658,375
Int. Cl.[4] C10G *45/00;* C07C *5/10*
U.S. Cl. 208—212 12 Claims

1. A process for the hydrogenation of aromatic hydrocarbons, which comprises the steps of:

(a) contacting an aromatic hydrocarbon feed comprising at least about 15 wppm organic nitrogen compound, calculated as elemental nitrogen, based on said feed, at hydrogenation conditions, in a hydrogenation zone, in the presence of added hydrogen and a hydrogen sulfide partial pressure of less than about 0.5 psia to minimize cracking of said feed to lower boiling products, with a catalyst comprising a Group VIII noble metal component and a Y-type crystalline aluminosilicate zeolite, for a time sufficient to decrease the hydrogenation activity of said catalyst, and

(b) contacting the resulting partially deactivated catalyst with a hydrogen-containing gas in the absence of said aromatic hydrocarbon feed at conditions and for a time sufficient to increase the hydrogenation activity of said partially deactivated catalyst said hydrogen treatment of step (b) is conducted intermittently during said hydrogenation process.

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**4,610,780**

## METHOD FOR REMOVING SULFUR-CONTAINING IMPURITIES FROM HYDROCARBONS

**J. Jay Grove, Alsip, and John Mooi, Homewood, both of Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Continuation of Ser. No. 713,070, Mar. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 557,565, Dec. 2, 1983, abandoned. This application Dec. 26, 1985, Ser. No. 815,274**

**Int. Cl.[4] C10G *29/00***

**U.S. Cl. 208—244** **14 Claims**

1. In a process for optimizing a given job of removing a predetermined proportion of sulfur-containing impurities from a given flow rate of a given liquid hydrocarbon stream having predetermined initial and final concentrations of sulfur-containing impurities and having a predetermined size reaction vessel for removal of the sulfurcontaining impurities, the improvement comprising removing sulfur from said liquid hydrocarbon stream under sulfur removing conditions by emplacing a sulfur-removing material in the reaction vessel and contacting in said reaction vessel said stream with said sulfur-removing material; said sulfur-removing material having a porosity selected in accordance with the formula.

$$P=(0.23\pm K)\times(LHSV)^{1.7}\times R\times F^2$$

wherein:

P is porosity;

K=0.121.55R;

LHSV is liquid hourly space velocity;

R is the ratio, in centimeters, of volume-tosurface area of said sulfur-removing material and ranges from about 0.01 cm. to about 0.06 cm.; and

F is a fraction equal to the proportion of sulfur-containing impurities removed, more specifically defined as the concentration of said sulfur containing impurities in said stream entering the contacting process less the concentration of said impurities in said stream exiting said process divided by the concentration of said impurities in said stream entering said process.

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**4,610,781**

## FLUID PROCESSING SYSTEM WITH FLOW CONTROL MANIFOLD

**Arnold C. Bilstad, Deerfield, and Robert J. Kruger, Arlington Heights, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 30, 1983, Ser. No. 567,363**

**Int. Cl.[4] B01D *13/00***

**U.S. Cl. 210—85** **7 Claims**

1. A fluid processing system comprising a fluid circuit including

a plurality of tubing segments each having an end portion, and

a fluid distribtuion manifold integrally attached in flow communication with each of said tubing segments, said manifold including

a pair of fluid impermeable sheets having opposite side edges peripherally sealed together to define a manifold interior,

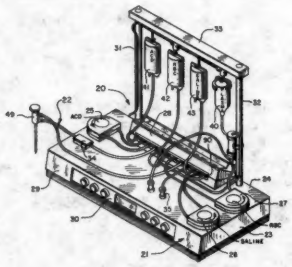
means for sealingly engaging said end portion of each of said tubing segments in a parallel spaced relationship along one of said sealed side edges, so that said tubing segments all communicate with said manifold interior, and

means for defining a plurality of baffles extending within said manifold interior between adjacent, sealingly engaged tubing segment end portions, said baffles extending from said one sealed side edge toward the opposite one of said sealed side edges to compartmentalize said manifold interior into adjacent fluid chambers, each associated with at least one of said flexible tubing segments, said baffles each having an end located at a generally equal distance from said opposite sealed side edge to define between said baffle ends and said opposite sealed side edge a plurality of mutually aligned passageways normally opening fluid communication between said adjacent fluid chambers and, thus, between associated tubing segments, and

a processing apparatus including

a receptacle for releasably receiving said opposite sealed side edge of said manifold with said tubing segments extending from said one sealed side edge externally of said receptacle,

pumping means attachable to at least one of said externally



extending tubing segments to pump fluid through said fluid circuit,

a plurality of valve actuator assemblies located within said receptacle, each of said valve actuator assemblies being aligned with one of said mutually aligned manifold passageways and being operative for selectively closing said aligned passageway to block fluid communication between the adjacent fluid chambers, and

process control means for actuating each of said valve actuator assemblies in a predetermined pattern to control fluid flow between fluid chambers within said manifold, thereby controlling fluid flow through said fluid circuit to achieve a desired fluid processing procedure,

said fluid manifold further including indicia thereon indicative of the procedure, said control means being responsive to said indicia.

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**4,610,782**

## HEMODIALYSIS SYSTEM HAVING A THERMOINSULATED CONTAINER

**Bernd Tersteegen, and Günter van Endert, both of Karlstrasse 17-19, 4000 Dusseldorf, Fed. Rep. of Germany**

**Continuation of Ser. No. 363,571, Mar. 30, 1982, abandoned. This application Mar. 14, 1984, Ser. No. 589,393**

**Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115665**

**Int. Cl.[4] B01D *31/00***

**U.S. Cl. 210—137** **17 Claims**

1. A system for hemodialysis treatment of a patient comprising:

(a) a dialyzer having a semipermeable membrane separating a first flow path for blood, the first flow path including a blood inlet and a blood outlet, and a second flow path for dialysate, the second flow path including a dialysate inlet and a dialysate outlet;

(b) a blood inflow line in fluid communication with the blood inlet and the patient for delivering blood from the patient to the first flow path;

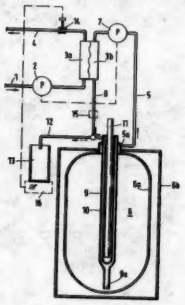
(c) a blood return line in fluid communication with the blood

outlet and the patient for returning blood from the first flow path to the patient;

(d) a container including an outlet means for drawing fresh dialysate from an upper zone of the container and inlet means for returning used dialysate to a lower zone of the container;

(e) a dialysate inflow line in fluid communication with the outlet means of the container and the dialysate inlet of the dialyzer;

(f) a dialysate return line in fluid communication with the dialysate outlet of the dialyzer and the inlet means of the



container for returning used dialysate of a temperature less than that of the fresh dialysate from the outlet of the dialyzer to the inlet means of the container;

(g) means for maintaining a substratification of fresh dialysate in the container above and in contact with used dialysate, said means including insulating means for thermally insulating the container to maintain a temperature of dialysate in the container within an acceptable range during hemodialysis treatment; and

(h) means for pumping dialysate through the second flow path and dialysate lines.

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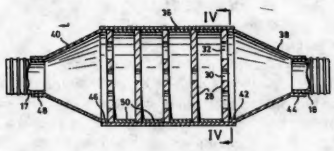
**4,610,783**

## CONTROL OF ALGAE IN RE-CIRCULATING WATER SYSTEMS

**Paul Hudson, 416 Claircrest Ave., Mississauga, Ontario, Canada L5A 1T6**

**Continuation-in-part of Ser. No. 545,527, Oct. 26, 1983, abandoned. This application Feb. 22, 1985, Ser. No. 705,359**
**Claims priority, application Canada, Nov. 4, 1982, 414853**
**Int. Cl.[4] C02F *1/50*; A61L *2/16***
**U.S. Cl. 210—169** **6 Claims**



1. A water re-circulation system comprising:

an open tank, which contains a body of water, which is open to sunlight and to the atmosphere;

feed and return pipes connected to the tank;

where the system is arranged so that the water, when in the tank, moves only imperceptibly during re-circulation, but the water, when in the pipes, moves at a rapid bulk volume flow rate during re-circulation;

a plastic jacket;

where the jacket is installed in and as part of one of the pipes and comprises a cylindrical sleeve of larger diameter than the pipe, each end of said jacket being connected to the pipe by a pipe-to-sleeve adapter which is a snug fit to the sleeve;

where the jacket has means defining an inlet and means defining an outlet connected into the said one of the pipes to accommodate the whole through-flow of water in the said one of the pipes;

where the jacket, apart from the inlet and outlet, is enlosed and sealed and capable of sustaining an internal water pressure;

substantially pure metallic zinc;

where the zinc is mounted in the jacket as a plurality of discs which are disposed co-axially with the sleeve so as to be well-exposed to the water that flows through the jacket;

where the discs are located in the sleeve by virtue of their being trapped therein between the two adapters;

and where the jacket contains substantially no other metal than zinc exposed to the flow of water through the jacket.

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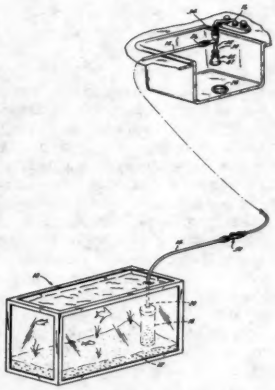
**4,610,784**

## METHOD AND APPARATUS FOR CLEANING AND FILLING AN AQUARIUM

**Lance Reyniers, 7705 N. Edgeworth Dr., Milwaukee, Wis. 53223**

**Filed Dec. 21, 1984, Ser. No. 684,940**
**Int. Cl.[4] E04H *3/16, 3/20***
**U.S. Cl. 210—169** **12 Claims**



1. Apparatus for use in cleaning and refilling an aquarium tank, the apparatus comprising:

an elongated flexible hose having opposite ends,

a gravel tube including an upper end connected to one of the opposite ends of the flexible hose, and a lower end adapted to be immersed in the aquarium tank such that the lower end is adjacent the bottom of the aquarium tank, the gravel tube having a diameter larger thatn the diameter of the elongated flexible hose, and

means for connecting the other end of the elongated flexible hose to a water source, said means for connecting including means for causing selective and alternative flow of water from the aquarium tank through the gravel tube and the elongated flexible hose to a drain and flow of water from the water source through the elongated flexible hose to the aquarium tank for refilling the aquarium tank, said means for connecting the other end of the hose to a water source including means for causing sufficient flow of water through the gravel tube, when said means for connecting causes water flow from the aquarium tank to the

drain, that gravel adjacent the bottom of the aquarium tank will be churned in the gravel tube, and sediment at the bottom of the tank adjacent the lower end of the gravel tube will be drawn into the gravel tube, separated from the gravel and discharged through the elongaged flexible hose to the drain, said flow of water through said gravel tube being insufficient to cause gravel churned in the gravel tube to pulled into the elongated flexible hose, said means for connecting the other end of the elongated flexible hose to the water source including a faucet pump adapted to be threaded onto a faucet, the faucet pump including a tube having opposite ends, one end being adapted to be connected to the faucet and an opposite end being adapted to discharge water into a drain, a venturi section intermediate said opposite ends of said tube, said elongated flexible hose being connected to said venturi section of said tube whereby water flow from the faucet through said tube causes water to be drawn through the elongated flexible hose and discharged into the drain.

10. A method for removing a portion of the water from an aquarium and also removing sediment from the aquarium and stirring gravel at the bottom of the aquarium to remove sediment from the gravel and for replacing the water removed from the aquarium to refill the aquarium, the method comprising the steps of

providing an elongated flexible hose,

providing a gravel tube connected to one end of the elongated flexible hose, the gravel tube comprising a hollow cylinder having an upper end connected to the elongated flexible hose and an open lower end,

connecting an opposite end of the elongated flexible hose to a faucet,

placing the lower open end of the gravel tube adjacent the bottom of the aquarium and adjacent the gravel supported at the bottom of the aquarium,

causing a flow of water from the bottom of the aquarium upwardly through the gravel tube and through the hose, the flow of water through the gravel tube being sufficient to lift gravel into the gravel tube and to churn that gravel so as to separate sediment from the gravel and to cause sediment at the bottom of the aquarium to be pulled into the gravel tube and into the hose, and the flow of water into the gravel tube being sufficient to cause the gravel to be pulled from the gravel tube into the hose,

discharging water drawn into the gravel tube through the elongated flexible hose into a drain, and

causing a flow of fresh water from the faucet through the elongated flexible hose and through the gravel tube to fill the aquarium, said step of connecting an opposite end of the elongated flexible hose to the faucet including the step of providing a tube having one end connected to the faucet, an opposite end for discharging water into the drain, and a venturi intermediate said opposite ends, said opposite end of said elongated flexible hose being connected to said tube adjacent said venturi whereby water flow from the faucet through the venturi to the drain causes flow of water from the elongated flexible hose into the tube, and wherein the step of causing flow of water from the bottom of the aquarium upwardly through the gravel tube includes discharging water from the faucet to the drain to cause water flow through the hose from the aquarium to the drain.

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**4,610,785**

## SLUDGE SEPARATION APPARATUS

**Frederick E. Russell, Elgin, Ill., assignor to Protectaire Systems Co., Elgin, Ill.**

**Filed Jan. 3, 1985, Ser. No. 688,571**

**Int. Cl.[4] B01D *21/04, 47/02;* B05C *15/00***

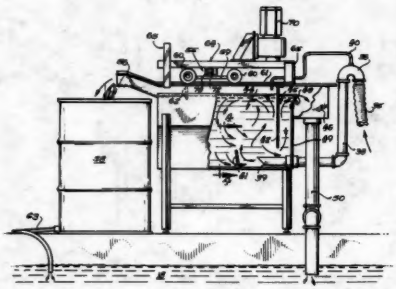
**U.S. Cl. 210—195.1** **11 Claims**

1. A sludge-separating apparatus for removing sludge from a liquid from an adjacent holding tank comprising, in combination,

a separation tank for receiving and holding a supply of liquid and sludge, the tank having a plurality of upstanding walls;

pump means for transporting sludge and liquid from the adjacent holding tank to the separation tank, the pump means having an inlet in the holding tank and an outlet disposed at the bottom of the separation tank so that as liquid and sludge are discharged from the outlet, sludge particles settling on the bottom of the separation tank are circulated upwardly to the surface of the liquid;

baffle means disposed in the separation tank adjacent the outlet of the pump means for directing sludge entering the separation tank through the pump means outlet toward the surface of the liquid in the separation tank;



means dividing the separation tank into two regions, the outlet of the pump means being in the first region, the dividing means allowing relatively sludge-free liquid to pass through into the second region;

liquid return means associated with the second region of the separation tank for returning the relatively sludge-free liquid to the holding tank; and

automatic skimmer means associated with the first region of the separation tank for skimming floating sludge from the surface of the liquid and discharging the sludge over one of the upstanding walls bounding the first region of the separation tank.

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**4,610,786**

## FILTER CAGE WITH REMOVABLE FILTERS

**James A. Pearson, Northumberland, Great Britain, assignor to Swinney Engineering Limited, Morpeth, England**

**Filed Mar. 28, 1984, Ser. No. 594,225**

**Claims priority, application United Kingdom, Mar. 29, 1983, 8308588**

**Int. Cl.[4] B01D *25/02, 25/08***

**U.S. Cl. 210—236** **12 Claims**

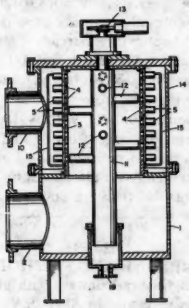
1. A filter comprising:

a filter cage having a row of holes therein;

a filter element mounted over each hole, said filter cage having opposed retaining means on opposite sides of the row of holes for securing each filter element, and each filter element having projecting flange means for engagement under the opposed retaining means in a first locked position for securing said filter element over the respective hole, each flange means having at least one cut away flat portion, with the flat portion of one filter element abutting the flat portion of a second adjacent filter element in said first, locked position for preventing angular movement of said filter members; and

releasable locking means for locking the filter elements in the row against lateral movement, said locking means being releasable to allow relative angular and lateral movement of said filter elements into a second, unlocked

position so that said flat portions of said filter elements can be aligned in the direction of the row to clear the retaining



means to allow removal of the filter element from the filter cage.

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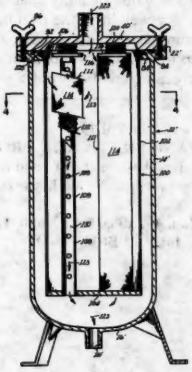
4,610,787

## CONVERTIBLE LIQUID FILTER

Howard W. Morgan, Michigan City, Ind., and Ronald L. Hartog, Three Oaks, Mich., assignors to Filter Specialists, Inc., Michigan City, Ind.

Continuation of Ser. No. 468,741, Feb. 22, 1983, abandoned. This application Sep. 25, 1984, Ser. No. 655,294
Int. Cl.[4] B01D *29/10*
U.S. Cl. 210—239 7 Claims



1. A liquid filter comprising in combination a filter housing and removable cover, said filter housing including a chamber defined by side and bottom walls and having an open top defined by said side wall, means defining a liquid inlet port into and a liquid outlet port from said housing chamber, said cover for spanning said housing open top in associated sealing engagement with said housing, a filtration means removably positioned within said housing chamber in liquid flow communication between said inlet and outlet ports for filtering liquid flowing though said filter housing between said ports, said filtration means including a basket having a side wall and a bottom wall, said basket bottom wall having means defining an opening formed therethrough, said filtration means including a cartridge element of tubular-shaped reticulated material supported over and in liquid flow communication with said basket bottom wall opening, means for supporting said basket between said inlet and outlet ports, wherein liquid after passing into said housing chamber through said inlet port flows into said basket and through said cartridge element and said basket bottom wall opening and out said housing chamber through said outlet port.

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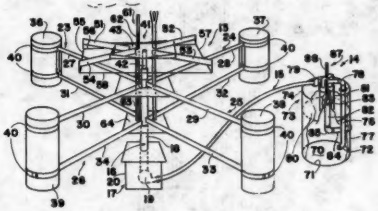
4,610,788

## OIL/WATER SEPARATING SYSTEM

Jay A. Ward, Box 185, Cody, Wyo. 82414

Filed May 6, 1985, Ser. No. 730,730
Int. Cl.[4] E02B *15/04*
U.S. Cl. 210—242.3 17 Claims

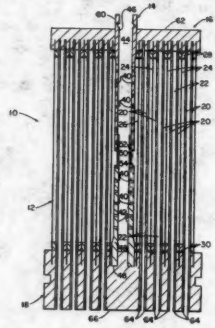


1. Oil/water separating system including a skimming apparatus and a separating apparatus operatively connected therewith; said skimming apparatus including an elongated central member disposed in a generally vertical orientation, an enlarged stabilizing section disposed adjacent a lower end of said central member, a plurality of equally spaced arm members at least four in number extending radially from said central member, each of said arm members including an upper arm section and a lower arm section spaced a significant distance therefrom, an elongated float member extending between each pair of said upper and lower arm sections, an inlet portion disposed above said central member and operatively connected therewith, said inlet portion including a central downspout member axially aligned above said central member in a communicating relationship, a transverse plate section surrounding said downspout member, said plate section being disposed closely adjacent to the top of said downspout member, a plurality of equally spaced vertically oriented fin sections extending horizontally outwardly from the upper surface of said plate section and radially of said downspout member, a bar section extending between each pair of adjoining fin sections adjacent the free ends thereof, adjusting means controlling the height of said downspout member above said central member, said adjusting means including a screw member operatively connecting said plate section and said central member; said separating apparatus being disposed adjacent to said skimming apparatus and operatively connected with said downspout member thereof through a flexible conduit member, said separating apparatus including an elongated vertically oriented main chamber, said chamber including a substantially open bottom, a liquid inlet into said chamber disposed adjacent said open bottom, flotation means adjacent an upper end of said chamber, a vertically oriented oil downspout disposed within said chamber along the axis thereof, an upper end of said oil downspout being located adjacent an upper end of said chamber, a discharge conduit operatively connected between said oil downspout and the exterior of said chamber, adjusting means controlling the height of said oil downspout within said chamber, said oil downspout adjusting means including a screw member extending between said oil downspout and the upper end of said separating apparatus; whereby when said skimming and separating apparatus are floating in a reservoir containing an oil/water mixture a surface layer thereof enters said downspout member of said skimming apparatus and passes through said flexible conduit member into said separating apparatus wherein an oil rich portion rises to the top of said main chamber and flows into and through said oil downspout and the water rich portion passes out of the bottom of said chamber.

## 4,610,789
## FILTRATION CARTRIDGE AND REACTOR

**Herbert W. Barch, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Apr. 22, 1985, Ser. No. 725,872**
**Int. Cl.[4] B01D *13/00***
**U.S. Cl. 210—321.4** **16 Claims**



1. A hollow fiber filter cartridge usable in a reactor, said filter cartridge comprising:

a filtration mat assembly including a plurality of generally parallel elongated hollow strands and at least a first fluid permeable sheet;

a porous central distribution tube about which said filtration mat assembly is wrapped;

spaced upper and lower end caps, upper and lower end portions of said central distribution tube and said filtration mat assembly being firmly embedded in said upper and lower end caps respectively; and

means for adjusting the length of said tube responsive to movement of said end caps toward or away from each other and in amounts sufficient to preclude breaking said strands upon stretching or crushing said strands upon compression.

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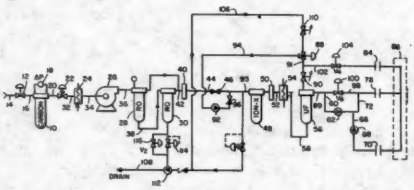
## 4,610,790
## PROCESS AND SYSTEM FOR PRODUCING STERILE WATER AND STERILE AQUEOUS SOLUTIONS

**Adrian R. Reti, Belmont, and James A. Benn, Lexington, both of Mass., assignors to Sterimatics Company Limited Partnership, Bedford, Mass.**

**Filed Feb. 10, 1984, Ser. No. 578,950**
**Int. Cl.[4] B01D *13/00***
**U.S. Cl. 210—636** **30 Claims**



1. A process for producing water substantially free of pyrogens to produce USP XX grade water for injection or irrigation solutions which comprises passing drinking quality water through a water purification system comprising:

(a) a filtration step to remove organic impurities;

(b) a reverse osmosis separation step to remove dissolved solids or ions, pyrogens and microorganisms from said water;

(c) a deionization step to remove ions from said water and to increase the electrical resistance of said water;

(d) an ultrafiltration step downstream of steps (a), (b) and (c) thereby to remove pyrogens from said water; and

(e) periodically washing ion exchange means in the deionization step for removing ions from said water and a membrane utilized in the ultrafiltration step with water heated to a temperature to sterilize microorganisms in said deionization and ultrafiltration steps and to remove impurities accumulated in said deionization step and said ultrafiltration step while avoiding washing steps (a) and (b) with said heated water.

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## 4,610,791
## DIALYSIS MEMBRANE AND METHOD OF MAKING

**Werner Henne, and Gustav Dünweg, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands**

**Continuation-in-part of Ser. No. 44,209, May 30, 1979, abandoned. This application Jun. 6, 1983, Ser. No. 501,527**
**Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2823985**
**Int. Cl.[4] B01D *13/00***
**U.S. Cl. 210—490** **22 Claims**

1. A dialysis membrane of a regenerated cuprammonium cellulose, said membrane having been dried by heat treatment at a temperature below 100° C., characterized by

(a) an ultrafiltration capacity at 37° C. of 7 to 30 $ml/hr \cdot m^2 \cdot mmHg$,

(b) an average molecular permeability, based upon vitamin B12, of $3 \cdot 10^{-3}$ to $12 \cdot 10^{-3}$ cm/min,

(c) a water retention value of more than 145% by weight based upon the dry weight of the membrane, and

(d) a cutoff for substances with a molecular weight from about 55,000 up to about 85,000 dalton, said cutoff being selected at a screening coefficient of S=0.02.

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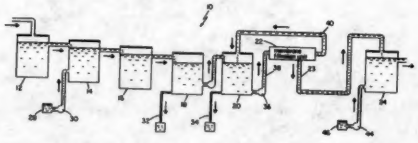
## 4,610,792
## MEMBRANE FILTRATION PROCESS

**Gerard J. Van Gils, Los Angeles, Calif., and Jacob Shorr, Lexington, Mass., assignors to Memtek Corporation, Woburn, Mass.**

**Filed Jan. 14, 1985, Ser. No. 691,445**
**Int. Cl.[4] B01D *13/00***
**U.S. Cl. 210—639** **12 Claims**



1. A process for treating wastewater including organic compounds and suspended solids as contaminants, said process comprising the steps of:

mixing lime with the wastewater at a concentration of not more than about 2400 mg/l;

permitting the wastewater with the lime mixed therein to settle to precipitate lime with contaminants adsorbed thereon;

thereafter mixing the settled wastewater with a particulate filter aid material to suspend the filter aid material therein at a concentration (wt/wt) of not less than about 0.05%; and,

thereafter passing the settled wastewater with the filter aid suspended therein through a membrane filtration unit in which the membrane pores are not less than about an

order of magnitude smaller than the diameter of the particles of filter aid material,

the filtration unit passing a permeate that is essentially free of suspended solid contaminants, the wastewater including the suspended filter aids being recirculated, and

including the step of removing organic contaminants by treating the wastewater with activated carbon,

whereby the treated water from the system is essentially free from suspended solids, has a TOC level less than about 200 mg/l and a total solids level less than about 2000 mg/l.

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4,610,793

## OIL EXTRACTION METHOD

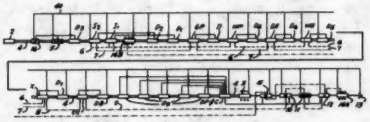
David P. J. Miller, 37 Binghill Park, Milltimber, Aberdeen AB1 0EE, Scotland

Filed Oct. 9, 1984, Ser. No. 658,783

Claims priority, application United Kingdom, Oct. 8, 1983, 8326964

Int. Cl.[4] E21B *43/24*

U.S. Cl. 210—767 5 Claims



1. A method of extracting oil from a mixture of oil and other fluid in an underground reservoir, comprising:

(a) providing separation means and heating means at the reservoir;

(b) withdrawing a portion of said mixture from the reservoir into the separator means;

(c) separating in the separator means the oil from said portion of the mixture to leave a residual fluid;

(d) passing the separated oil to the surface;

(e) heating the residual fluid in the heating means to provide a gas of increased volume; and

(f) introducing the gas into the reservoir whereby the increased volume of the gas is sufficient to maintain the fluid pressure in the reservoir at the level prior to withdrawal of said portion of the mixture from the reservoir into the separator means.

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4,610,794

## HIGH CURRENT DIVERSIONARY OIL-BOOM

Demosthenes T. Tsahalis, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 196,230, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 79,687, Sep. 28, 1979, abandoned. This application Feb. 18, 1983, Ser. No. 468,020

Int. Cl.[4] C02F *1/40;* E02B *15/04*

U.S. Cl. 210—776 5 Claims

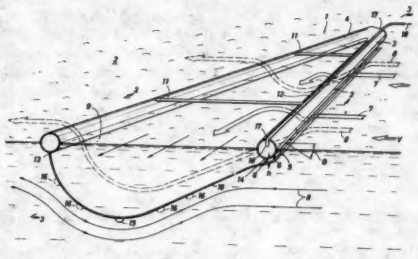
2. Method for skimming and diverting a floating liquid pollutant on a water surface, comprising:

providing at least two buoyant members spaced apart and describing a capture area;

providing a substantially water and pollutant impermeable membrane disposed between said buoyant members defining a capture volume which has an increasing cross-sectional area in the direction of said open end, said capture volume directing said pollutant to a collection area;

directing said pollutant into said capture area by maintaining a current velocity relative to said buoyant members; and,

maintaining a constant mean flow velocity throughout said capture volume such that an increasingly larger thickness



of said pollutant collects within said capture volume in the direction of said collection area.

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4,610,795

## PEROXYGEN BREAKER SYSTEMS FOR WELL COMPLETION FLUIDS

Robert D. Norris, Hightstown; Richard A. Brown, Trenton, and Gaylen R. Brubaker, Hightstown, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 7, 1985, Ser. No. 763,169

Int. Cl.[4] E21B *43/26*

U.S. Cl. 252—8.551 4 Claims

1. An aqueous hydraulic medium suitable for treating a subterranean formation comprising:

a. from 1 to 100 kilograms per cubic meter of a hydratable polymeric material selected from the group consisting of polysaccharides, polysaccharide derivatives, polyacrylamides, polyacrylamide copolymers, and mixtures thereof,

b. a peroxygen compound capable of generating free radicals selected from the group consisting of hydrogen peroxide, t-butylhydroperoxide, ammonium and alkali metal salts of monopersulfuric acid, and ammonium and alkali metal salts of dipersulfuric acid, in an amount equal to 1 to 20 parts by weight per 100 parts by weight of said polymeric material, and

c. nitrite ions in an amount equal to 0.1 to 10 parts by weight of sodium nitrite per part by weight of the peroxygen compound in the hydraulic medium.

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4,610,796

## FABRIC SOFTENER COMPOSITION CONTAINING MOLECULAR SIEVE ZEOLITE

William Chirash, New Providence, and Harold E. Wixon, New Brunswick, both of N.J., assignors to The Colgate-Palmolive Co., New York, N.Y.

Continuation of Ser. No. 659,907, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 92,846, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 785,474, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 683,973, May 6, 1976, abandoned, which is a continuation of Ser. No. 503,735, Sep. 5, 1974, abandoned. This application Aug. 2, 1985, Ser. No. 762,795

Int. Cl.[4] C11D *1/62, 1/65, 3/12;* D06M *13/46*

U.S. Cl. 252—8.75 1 Claim

1. A method of softening fabrics which comprises agitating said fabrics in an aqueous medium containing

(a) a heavy duty spray dried built synthetic detergent composition consisting of 10% sodium linear tridecyl benzene sulfonate, 2% of a nonionic detergent which consists of a $C_{14}$–$C_{15}$ fatty alcohol condensed with an average of 11 ethylene oxide groups per molecule, 1% of a mixed sodium coconut/tallow (20:80) fatty acid soap, 33% of pentasodium tripolyphosphate, 7% of sodium silicate wherein

the ratio of $Na_2O$ to $SiO_2$ is 1:2.35, 0.5% sodium carboxymethyl cellulose, with the balance of the detergent composition being optical brighteners, about 38% sodium sulfate, and about 7% moisture;

(b) a softening composition consisting of about 20% of distearyl dimethyl ammonium chloride, about 40% of Type A synthetic sodium molecular sieve zeolite having a mean particle diameter of 5.9 to 6.4 microns and containing about 21% water, and about 40% sodium perborate;

wherein about 0.1% to about 0.3% by weight of the aqueous medium consists of (a) and (b), and the ratio of (a) to (b) is 2:1.

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**4,610,797**

## METALLO-ORGANO ALUMINATES AS LUBRICANT ADDITIVES

**Kishore K. Kar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 619,442, Jun. 11, 1984, Pat. No. 4,519,924. This application May 24, 1985, Ser. No. 737,314**

**Int. Cl.[4] C10M *129/26***

**U.S. Cl. 252—35** **17 Claims**

1. A method for improving the anti-friction properties of lubrication fluids subjected to intensive shearing or grinding forces, said method comprising

uniformly dispersing in said fluid, as small particles, at least one crystalline aluminate conforming substantially to the formulae

$$Li(R)_r^v.2Al(OH)_3.nH_2O, \quad \text{I.}$$

and

$$M_m(R)_r^v(A)_y^w.2Al(OH)_3.nH_2O \quad \text{II.}$$

where

$nH_2O$ represents any waters of hydration that may be present;

R represents a monocarboxylic acid or dicarboxylic acid of $C_6$–$C_{22}$, including those which are OH-substituted;

r is greater than zero and represents the number of R ions in the molecule;

v is the valence of R, being monovalent or divalent,

M is divalent Zn or Ca cations;

A represents inorganic anions of valence 1–3, represented by w;

y is equal to or greater than zero and represents the number of A anions;

wherein, in formula I, vr represents an amount of R anions to substantially satisfy the valence requirements of Li;

wherein, in formula II, r>y and (vr+wy) represents an amount of combined anions, R and A, to substantially satisfy the valence requirements of M;

with m representing the number of divalent M cations and having a numerical value in the range of about 1 to about 4.

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**4,610,798**

## METHOD AND COMPOSITION OF MATTER FOR CONDITIONING AND PASSIVATING CERTAIN METALS

**Michael Burkus, 796 Bear Rd., Berwyn, Pa. 19312**

**Filed Apr. 16, 1985, Ser. No. 723,817**

**Int. Cl.[4] C09K *13/04*; C23G *1/02*; C23F *1/00*; B44C *1/22***

**U.S. Cl. 252—79.2** **4 Claims**

1. An acqueous conditioning and passivation solution comprising:

(a) an acqueous solution of nitric acid, containing from 4 fluid ounces to 24 fluid ounces, by volume, of 71% nitric acid, per gallon of solution;

(b) an acqueous solution of sulfuric acid containing 2 fluid ounces to 8 fluid ounces, by volume, of 93% sulfuric acid, per gallon of solution;

(c) from 1 ounce to 5 ounces, by weight, of solid chromium trioxide, per gallon of solution;

(d) water to make up the difference between the volume of liquids and solids in said solution of nitric acid, said solution of sulfuric acid and said chromium trioxide and one gallon of solution.

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**4,610,799**

## WASHING ADDITIVE IN PASTE FORM CONTAINING AN ACTIVATOR FOR PER COMPOUNDS, AND PACKAGE THEREFOR

**Heinz-Manfred Wilsberg, Cologne; Rolf Puchta, Haan; Klaus Koester, Langenfeld, and Franz-Josef Carduck, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany**

**Filed Apr. 22, 1985, Ser. No. 725,842**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415880**

**Int. Cl.[4] C11D *3/32, 3/39, 17/00, 17/08***

**U.S. Cl. 252—90** **19 Claims**

1. A detergent paste composition comprising:

(a) from about 2 to about 30 parts by weight of at least one nonionic surfactant which is an adduct of ethylene oxide with a fatty alcohol or an oxoalcohol wherein the fatty alcohol or oxoalcohol contains from 12 to 18 carbon atoms and the adduct contains from 3 to 10 moles of ethylene oxide per mole of alcohol,

(b) from about 0.5 to about 10 parts by weight of at least one of:

(i) a quaternary ammonium compound containing a long-chain $C_{10}$–$C_{20}$ alkyl or alkenyl group and three $C_1$–$C_4$ alkyl groups,

(ii) a fatty amine derivative which is an adduct of 1 to 6 moles of ethylene oxide with 1 mole of a primary fatty amine having a long-chain $C_{10}$–$C_{18}$ alkyl or alkenyl group,

(iii) a compound of the formula R—NH—$CH_2$—CH-2—COONa where R is a $C_{10}$∝$C_{18}$ alkyl or alkenyl group,

(c) from about 2 to about 30 parts by weight of at least one actinator for per compounds,

(d) from about 2 to about 50 parts by weight of at least one polyhydric alcohol antigel agent,

(e) from about 5 to about 20 parts by weight of at least one viscosity regulator in an amount sufficient to give the detergent composition a viscosity of from about 1000 to about 100,000 mPas, wherein the at least one viscosity regulator is selected from the group consisting of water insoluble zeolites, highly dispersed silica, layer silicates, water-soluble salts, sugars, polyglycols, and fatty alcohol ethoxylates containing at least about 15 moles of ethylene oxide per mole of fatty alcohol,

(f) from 0 to about 5 parts by weight of at least one heavy metal complexing agent, and, optionally,

(g) a small quantity of a foam regulator, a dye, or both.

2. A washing additive comprising:

A. a detergent paste composition, and

B. a bag-like structure surrounding the detergent composition wherein the bag-like structure is a polyvinyl alcohol-based film readily soluble in borate-containing aqueous solutions, and

wherein the detergent composition contains.

(a) from about 2 to about 30 parts by weight of at least one nonionic surfactant which is an adduct of ethylene oxide with a fatty alcohol or an oxoalcohol wherein the fatty alochol or oxoalcohol contains from 12 to 18 carbon atoms and the adduct contains from 3 to 10 moles of ethylene oxide per mole of alcohol,

(b) from about 0.5 to about 10 parts by weight of at least one of:

(i) a quaternary ammonium compound containing a long-chain $C_{10}$–$C_{20}$ alkyl or alkenyl group and three $C_1$–$C_4$ alkyl groups,

(ii) a fatty amine derivative which is an adduct of 1 to 6 moles of ethylene oxide with 1 mole of a primary fatty

amine having a long-chain $C_{10}$–$C_{18}$ alkyl or alkenyl group,

(iii) a compound of the formula R—NH—$CH_2$—CH-2—COONa where R is a $C_{10}$–$C_{18}$ alkyl or alkenyl group,

(c) from about 2 to about 30 parts by weight of at least one activator for per compounds,

(d) from about 2 to about 50 parts by weight of at least one polyhydric alcohol antigel agent,

(e) from about 5 to about 20 parts by weight of at least one viscosity regulator in an amount sufficient to give the detergent composition a viscosity of from about 1000 to about 100,000 mPas, wherein the at least one viscosity regulator is selected from the group consisting of water insoluble zeolites, highly dispersed silica, layer silicates, water-soluble salts, sugars, polyglycols, and fatty alcohol ethoxylates containing at least about 15 moles of ethylene oxide per mole of fatty alcohol,

(f) from 0 to about 5 parts by weight of at least one heavy metal complexing agent, and optionally,

(g) a small quantity of a foam regulator, a dye, or both.

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**4,610,800**

## METHOD FOR UNCLOGGING DRAINAGE PIPES

**Donald Durham, Germantown; J. Leslie Glick, Potomac; Douglas W. Fodge, Rockville, and Wayne E. Swann, Columbia, all of Md., assignors to Genex Corporation, Rockville, Md.**

**Filed Jan. 25, 1985, Ser. No. 695,219**

**Int. Cl.⁴ C11D *7/42;* D06M *16/00***

**U.S. Cl. 252—174.12** **2 Claims**

1. A method for unclogging drainage pipes blocked by cellulosic paper materials which comprises contacting the paper with a thickened fluid composition comprising from about 5% to about 20% by weight of a cellulase enzyme and from about 0.1% to about 1.0% of a non-cellulosic, water-soluble gum at a pH of 4.5 to 8.5, the cellulase enzyme being present in an amount sufficient to digest the cellulose in the paper.

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**4,610,801**

## COMPOSITIONS COMPRISING MINERAL PARTICLES IN SUSPENSION AND METHOD OF TREATING AQUEOUS SYSTEMS THEREWITH

**Kenneth B. Matthews, Swanscombe; Christine A. Beckett, Higham; David E. Smith, New Barn, and Richard R. Davidson, Cambridge, all of England, assignors to Blue Circle Industries PLC, London, England**

**Continuation of Ser. No. 534,561, Sep. 22, 1983, abandoned. This application Oct. 22, 1985, Ser. No. 790,632**

**Claims priority, application United Kingdom, Sep. 24, 1982, 8227366**

**Int. Cl.⁴ C02F *1/00***

**U.S. Cl. 252—181** **8 Claims**

1. A composition for treating an aqueous system, which composition comprises (a) an aqueous slurry of mineral particles of at least 40% m/m mineral solids concentration, characterised in that it also comprises (b) an agent or mixture of agents that at least substantially maintains the mobility of the slurry, such that the apparent viscosity of the slurry does not exceed 500 cP (as measured at a shear rate of 600 $s^{-1}$) and that exerts a flocculating action upon dilution of the composition with or into water at a dilution ratio of at least 20:1 (m/m), said agent(s) being selected from cationic polyelectrolytes that have nitrogen-containing groups, amphoteric polyelectrolytes that have nitrogen-containing groups and, provided that the mineral particles include calcium hydroxide particles, anionic polyacrylamides.

**4,610,802**

## METHOD OF ACTIVATING THIOUREA DIOXIDE

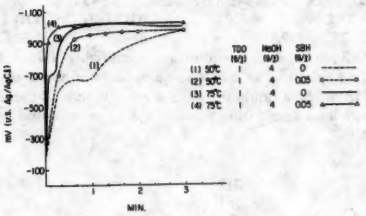
**Koichiro Fujiyasu; Shigeki Yoneyama, and Haruhiko Ito, all of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 12, 1984, Ser. No. 660,385**

**Claims priority, application Japan, Dec. 29, 1983, 58-246246**

**Int. Cl.⁴ C09K *3/00***

**U.S. Cl. 252—188.2** **4 Claims**




1. A method of activating thiourea dioxide, characterized by incorporating in the thiourea dioxide a substance which dissolves in water or an acidic aqueous solution and produces hydrogen.

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**4,610,803**

## AZO DYESTUFFS AND LIQUID-CRYSTAL MATERIAL CONTAINING AZO DYESTUFFS

**Uwe Claussen, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

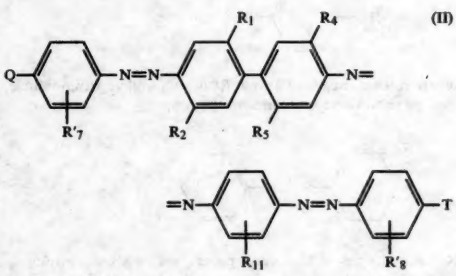
**Filed Dec. 9, 1983, Ser. No. 560,018**

**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245751**

**Int. Cl.⁴ G02F *1/13;* C09K *3/34***

**U.S. Cl. 252—299.1** **5 Claims**

1. Liquid-crystal material containing 0.01 to 30% by weight of a dyestuff of the formula




in which

$R'_7$, $R'_8$ and $R_{11}$ denote hydrogen, halogen, cyano, nitro, alkyl or alkoxy and

T and Q represent —$OR_7$, —$SR_7$ or —$NR_7R_8$ and

$R_1$, $R_2$, $R_4$ and $R_5$ denote hydrogen, halogen, trifluoromethyl, nitro, alkyl, alkoxy, alkylcarbonyl, alkylthio or alkoxycarbonyl and

$R_7$, $R_8$ denote hydrogen, alkyl, alkyl interrupted by 1–3 non-adjacent O atoms, cycloalkyl, aryl, aralkyl, aralkyl in which the alkyl portion is interrupted by 1–3 non-adjacent O atoms and in the case of —$NR_7R_8$

$R_7$, $R_8$ with the inclusion of the N atom can form a 5-membered to 8-membered ring.

4,610,804

# ANTHRAQUINONE DYES AND LIQUID CRYSTAL COMPOSITIONS INCLUDING THE SAME

**Shuji Imazeki, Hitachi; Akio Mukoh, Mito; Mikio Sato, Hitachi; Masaharu Kaneko, Yamato; Tetsuo Ozawa, Tokyo, and Tomio Yoneyama, Kawasaki, all of Japan, assignors to Hitachi, Ltd. and Mitsubishi Chemical Industries, both of Tokyo, Japan**

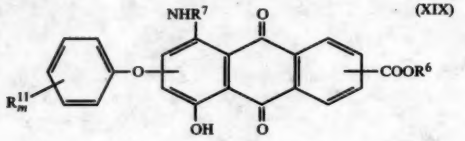
**Filed Mar. 22, 1984, Ser. No. 592,255**

**Claims priority, application Japan, Mar. 23, 1983, 58-48143; Mar. 23, 1983, 58-48144; Apr. 1, 1983, 58-58323**

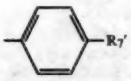
**Int. Cl.**[4] **C09K** *3/34;* **G02F** *1/13;* **C07C** *103/75;* **C09B** *1/36*

**U.S. Cl. 252—299.1** **20 Claims**

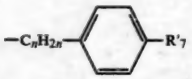
1. A liquid crystal composition comprising a host liquid crystal material and at least one quest anthraquinone dye dissolved in the host liquid crystal material, wherein at least one of the at least one anthraquinone dye is represented by the formula:



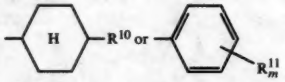

wherein $R^7$ is hydrogen, an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group, where said aryl group is



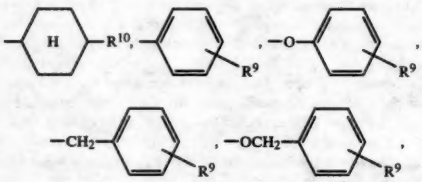

wherein $R'_7$ is hydrogen, a $C_{1-9}$ alkyl group either unsubstituted or substituted with an alkoxy group, a $C_{1-9}$ alkoxy group, and a cycloalkyl group either unsubstituted or substituted with an alkyl group, and where said aralkyl group is




where n is an integer of 1 to 9; $R^6$ is a $C_{1-9}$ alkyl group which may be substituted with an alkoxy group,




$R^{10}$ is hydrogen, a $C_{1-9}$ alkyl group, a $C_{1-9}$ alkoxy group, a cycloalkyl group which may be substituted with an alkyl group; $R^{11}$ is hydrogen, a $C_{1-9}$ alkyl group which may be substituted with an alkoxy group, a $C_{1-9}$ alkoxy group,

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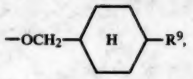
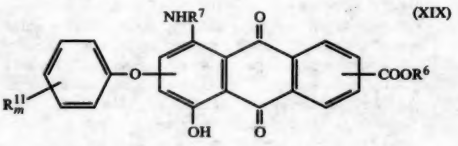
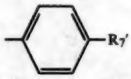



a halogen or a dialkylamino group; $R^9$ is hydrogen, a $C_{1-9}$ alkyl group which may be substituted with an alkoxy group, or a $C_{1-9}$ alkoxy group; and m is 1 to 3.

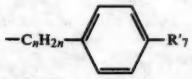
4. A pleochroic anthraquinone dye of the formula:



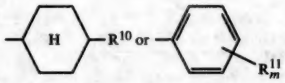

wherein $R^7$ is hydrogen, an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group, where said aryl group is



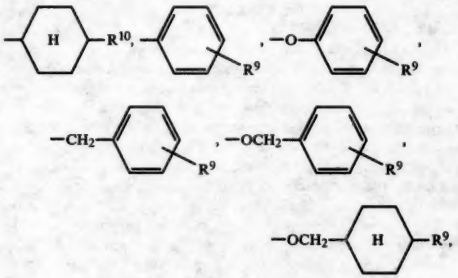

wherein $R'_7$ is hydrogen, a $C_{1-9}$ alkyl group either unsubstituted or substituted with an alkoxy group, a $C_{1-9}$ alkoxy group, and a cycloalkyl group either unsubstituted or substituted with an alkyl group, and where said aralkyl group is




where n is an integer of 1 to 9; $R^6$ is a $C_{1-9}$ alkyl group which may be substituted with an alkoxy group,




$R^{10}$ is hydrogen, a $C_{1-9}$ alkyl group, a $C_{1-9}$ alkoxy group, a cycloalkyl group which may be substituted with an alkyl group; $R^{11}$ is hydrogen, a $C_{1-9}$ alkyl group which may be substituted with an alkoxy group, a $C_{1-9}$ alkoxy group,




a halogen or a dialkylamino group; $R^9$ is hydrogen, a $C_{1-9}$ alkyl

group which may be substituted with an alkoxy group, or a $C_{1-9}$ alkoxy group; and m is 1 to 3.

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**4,610,805**

## NEMATIC LIQUID CRYSTAL MIXTURES

**Michael Schellenberger, Leipzig; Sabine Richter, Genthin; Hans-Joachim Deutscher, Halle; Horst Zaschke, Halle, and Dietrich Demus, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.**

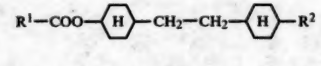
**Filed Jan. 29, 1985, Ser. No. 696,138**

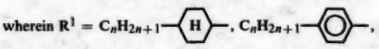
**Claims priority, application German Democratic Rep., Feb. 16, 1984, 260127**

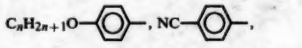
**Int. Cl.⁴ C09F** *3/34;* **G02F** *1/13;* **C07C** *69/75, 69/753, 69/76, 121/52, 121/60*

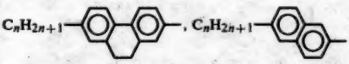
**U.S. Cl. 252—299.62** **10 Claims**

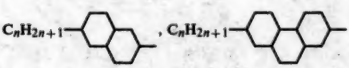
**10.** A compound of the general formula:











and $R^2 = C_mH_{2m+1}$

wherein n, m=1 to 10, said compound, when added as a component to a nematic liquid crystalline mixture, providing a formulation in which the characteristics of said mixture are influenced and modified in the direction of high clarification temperatures and points, without substantially increasing the viscosity of the mixture, so that simultaneous favorable switching times are obtained.

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**4,610,806**

## SKIN-MARKING COMPOSITIONS AND DEVICES, AND THEIR USE

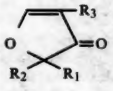
**Gerald M. Rosen, 403 Knob Ct., Chapel Hill, N.C. 27514**

**Division of Ser. No. 435,152, Oct. 19, 1982, Pat. No. 4,572,831. This application Dec. 12, 1985, Ser. No. 807,931**

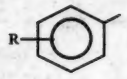
**Int. Cl.⁴ C09K** *11/06*

**U.S. Cl. 252—301.16** **11 Claims**

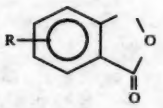
**1.** A skin-marking composition adapted for temporarily identifying a defined area of the epidermis under visible light and rendering the area fluorescent for a prolonged period of time under ultraviolet light, comprising a non-fluorescing dermatologically acceptable solution of (a) a fugitive dye or pigment and (b) a skin fluorescingly effective amount of a furanone of the formula



wherein $R_1$ is lower alkoxy or phenyl lower alkoxy and $R_2$ is



or, $R_1$ and $R_2$ collectively are



wherein K in each instance is hydrogen or one or more of halogen, lower alkyl, trifluoromethyl, lower alkoxy, nitro, cyano, carboxy or carboxy lower alkyl, and $R_3$ is lower alkyl, phenyl lower alkyl or aryl, in a liquid vehicle in which the furanone compound is stable.

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**4,610,807**

## DISTYRYL COMPOUNDS

**Wolfgang Brinkwerth, Leverkusen, and Udo Eckstein, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

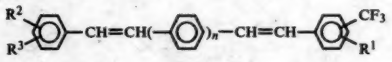
**Filed Oct. 18, 1984, Ser. No. 662,470**

**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339383**

**Int. Cl.⁴ C09K** *11/06*

**U.S. Cl. 252—301.21** **7 Claims**

**1.** A distyryl compound of the formula



wherein

$R^1$ is hydrogen, halogen, alkyl, alkoxy, aminocarbonyl, cyano, acyl, acylamino hydroxyl, aryloxy, aralkoxy, alkoxycarbonyl or acyloxy,

$R^2$ is hydrogen, halogen, aryl, alkyl, aralkyl, hydroxyl, alkoxy, aralkoxy, aryloxy, carboxyl, alkoxycarbonyl, aryloxycarbonyl, aralkoxycarbonyl, aminocarbonyl or cyano,

$R^3$ is hydrogen, halogen, alkyl or $CF_3$, and

N is 1 or 2, and

wherein said alkyl radicals are $C_1$–$C_4$-alkyl which may be monosubstituted by hydroxyl, $C_1$–$C_4$-alkoxy, cyano, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, aminocarbonyl, chlorine or bromine or is trifluoromethyl; said aryl is phenyl which may be substituted by $C_1$–$C_4$-alkyl, trifluoromethyl, chlorine, bromine, carboxyl, cyano, $C_1$–$C_4$-alkoxycarbonyl, or $C_1$–$C_4$-alkoxy; said aralkyl is phenyl-$C_1$–$C_4$-alkyl, which may be substituted in the phenyl nucleus by chlorine, methyl or methoxy, said alkoxy is $C_1$–$C_4$-alkoxy and said acyl is $C_1$–$C_4$-alkyl-carbonyl, $C_1$–$C_4$-alkoxycarbonyl, $C_1$–$C_4$-alkylsulphonyl, $C_1$–$C_4$-alkoxysulphonyl, optionally methyl-, methoxy- or chlorine-substituted benzoyl, benzenesulphonyl, phenyl-$C_1$–$C_4$-alkoxycarbonyl, or phenoxycarbonyl.

4,610,808

## CONDUCTIVE RESINOUS COMPOSITES

Lothar W. Kleiner, Mentor, Ohio, assignor to Mitech Corporation, Willoughby, Ohio

Continuation-in-part of Ser. No. 399,483, Jul. 19, 1982, abandoned. This application May 31, 1983, Ser. No. 499,319
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—512 21 Claims

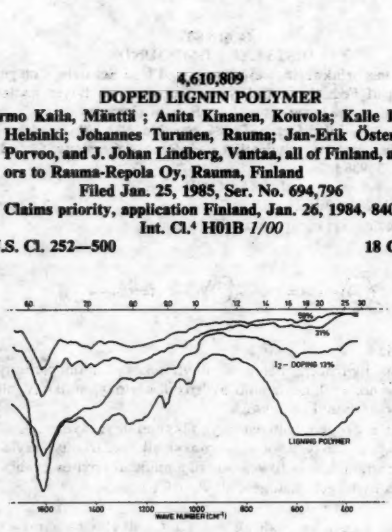
14. An electroconductive resinous composition having improved electroconductivity based on the amount of electroconductive fillers therein for preparing electroconductive molded or extruded articles, said composition comprising a cementitious resinous matrix having fillers uniformly dispersed within, said fillers comprising a mixture of electroconductive high aspect ratio filler in an amount equal to from 0.1% to 40% by volume, said high aspect ratio being greater than 10/1, and a low aspect ratio filler selected from the group consisting of metal oxides such as from cobalt, aluminum, chromium, iron, zinc, titanium, manganese, antimony, nickel or copper; mixed metal oxides of the said metal oxides; silicon oxides, metal carbides, silicon carbides; and particulate glass, in an amount between 0.1 and 15 parts per hundred (resin), said low aspect ratio being less than 10/1.

4,610,809

## DOPED LIGNIN POLYMER

Ermo Kaila, Mänttä ; Anita Kinanen, Kouvola; Kalle Levon, Helsinki; Johannes Turunen, Rauma; Jan-Erik Österholm, Porvoo, and J. Johan Lindberg, Vantaa, all of Finland, assignors to Rauma-Repola Oy, Rauma, Finland

Filed Jan. 25, 1985, Ser. No. 694,796
Claims priority, application Finland, Jan. 26, 1984, 840312
Int. Cl.[4] H01B 1/00
U.S. Cl. 252—500 18 Claims




1. Doped lignin polymer comprising an undoped polymer containing a maximum of 55 percent by weight of sulphur and a compound activating the conductivity of said polymer in a quantity of 0.1 to 60 percent of the weight of the undoped polymer.

2. Lignin polymer as claimed in claim 1 wherein the compound that activates the conductivity is iodine, bromine, chlorine, iodine bromide, iodine chloride, arsenic pentafluoride, ferric chloride, molybdenum pentachloride, stannic chloride, sulphuric acid, or perchloric acid.

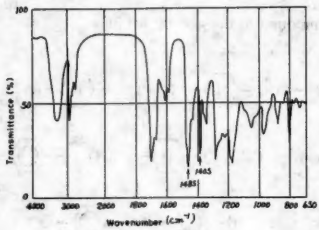
6. Lignin polymer as claimed in claim 1 wherein the agent that activates the conductivity is lithium, sodium, or potassium.

4,610,810

## RADIATION CURABLE RESIN, PAINT OR INK VEHICLE COMPOSITION COMPRISING SAID RESIN AND MAGNETIC RECORDING MEDIUM OR RESISTOR ELEMENT USING SAID RESIN

Yo Hasegawa, Nara; Satoshi Murakawa, Neyagawa, and Yukihiro Shimazaki, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 620,331, Jun. 12, 1984. This application May 17, 1985, Ser. No. 735,110
Claims priority, application Japan, Jun. 17, 1983, 109528; Jun. 20, 1983, 58-111217
Int. Cl.[4] H01B 1/02; H01C 2/00
U.S. Cl. 252—511 8 Claims




1. A resistor element characterized in that which is prepared by curing a conductive paint or ink comprising an acryl or methacryl ester solution of bisphenol A-formaldehyde condensation product, and a conductive powder.

4,610,811

## IODINE-CONTAINING CONDUCTIVE RESIN COMPOSITION

Takakazu Yamamoto; Sadaaki Yamamoto; Sadao Kobayashi, and Hiroshi Sukawa, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,880
Claims priority, application Japan, Mar. 7, 1984, 59-41890; May 17, 1984, 59-97423
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—511 3 Claims

1. An iodine-containing conductive resin composition which comprises: (i) a complex adduct of iodine and a polymer capable of forming a complex adduct with iodine, the content of said iodine being 1 to 95 percent by weight based on the total weight of said composition, said polymer being selected from the group consisting of a polyamide, a poly(meth)acrylamide, a polyurethane, a polyvinyl alcohol, a polyether and a blend of two or more of such polymers, and (ii) 0.5 to 60 percent by weight, based on the total weight of polymer and carbon, of carbon selected from the group consisting of carbon black, acetylene black, graphite and Ketjen Black, said carbon being dispersed in said complex adduct.

4,610,812

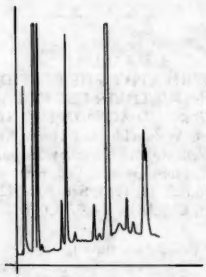
## USES OF METHYL PHENYL PENTANOL DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 681,656, Dec. 14, 1984. This application Oct. 4, 1985, Ser. No. 784,059
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] C11B 9/00
U.S. Cl. 252—522 R 7 Claims

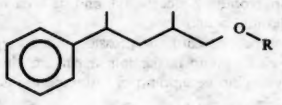
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of

perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma



GLC PROFILE FOR EXAMPLE I.

augmenting or enhancing quantity of a 2-methyl-4-phenyl-1-pentanol derivative defined according to the structure:



wherein R is hydrogen or acetyl.

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**4,610,813**

## HYDROXYLIC CAMPHOLENIC ALDEHYDE DERIVATIVES, THEIR UTILIZATION AS PERFUME INGREDIENTS AND PERFUMING COMPOSITIONS CONTAINING SAME

**Karl-Heinrich Schulte-Elte, Onex; Bernard L. Muller, and Hervé Pamingle, both of Geneva, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland**

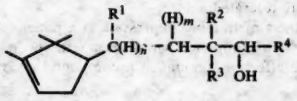
**Filed Mar. 12, 1985, Ser. No. 710,886**

**Claims priority, application Switzerland, Mar. 23, 1984, 1473/84**

**Int. Cl.⁴ A61K *7/46*; C07C *35/06***

**U.S. Cl. 252—522 R** **12 Claims**

1. A compound of formula



(I)

wherein:

a. $R^1=CH_3$; n=m=1; $R^2=CH_3$; $R^3=R^4=H$,
b. $R^1=CH_2$; n=0; m=1; $R^2=CH_3$; $R^3=R^4=H$,
c. $R^1=CH—CH_3$; n=0; m=1; $R^2=CH_3$; $R^3=R^4=H$,
d. $R^1=H$; n=m=0; $R^2=R^4=CH_3$; $R^3=C_2H_5$,
e. $R^1=H$; n=m=0; $R^2=R^3=R^4=CH_3$,
f. $R^1=H$; n=m=0; $R^2=CH_3$; $R^3=C_2H_5$; $R^4=H$,
g. $R^1=H$; n=m=0; $R^2=R^3=CH_3$; $R^4=H$,
h. $R^1=H$; n=m=1; $R^2=CH_3$; $R^3=C_2H_5$; $R^4=H$
i. $R^1=H$; n=m=1; $R^2=R^3=CH_3$; $R^4=H$

and wherein one of the dotted lines stands for a single carbon-carbon bond and the other one for a double bond, or each of them designates a single bond.

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**4,610,814**

## PROCESS FOR THE PREPARATION OF PROTEIN CONCENTRATES AND NUTRIMENTS BY PROCESSING ANIMAL BLOOD

**Laszlo Dede; Maria Dede nee Pal, both of Budapest; Terez Varga nee Varga, Kiskunhalas; Peter Barati, Kunfeherto; Imre Szarvas, Kiskunhalas; Beno Fodor; Imre Szecsenyi, both of Kunfeherto; Jozsef Pap Szekeres, Kiskunhalas, and Kalman Serester, Budapest, all of Hungary, assignors to Kiskunhalasi Allami Gazdasag, Kiskunhalas, Hungary**

**Filed Jun. 4, 1984, Ser. No. 616,944**

**Claims priority, application Hungary, Jun. 3, 1983, 1992/83**

**Int. Cl.⁴ A23J *1/06***

**U.S. Cl. 530—380** **10 Claims**

1. A process for the preparation of a concentrated protein nutriment from animal blood which comprises the steps of:

(a) dissolving in animal blood or in a blood fraction thereof 1 to 6% by weight of a sodium salt selected from the group which consists of sodium chloride, sodium hydrogen carbonate, and sodium carbonate;

(b) also dissolving in the animal blood or in the blood fraction thereof the following additives:
1 to 6% by weight of a pharmaceutically acceptable iron (II) salt;
up to 3% of an organic acid or an alkali metal salt thereof;
up to 1% of a trace element;
up to 1% of an antibiotic or vitamin; and
activated carbon in an amount of 5 to 10% by weight;
to form a mixture;

(c) heat-treating the mixture formed during steps (a) and (b) at a temperature between 70° and 140° C. to obtain a solid product which includes precipitated proteins contained in the animal blood or blood fraction thereof; and

(d) drying the precipitated proteins.

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**4,610,815**

## PROCESS FOR PRODUCING AND OBTAINING ANAPHYLATOXIN- AND COCYTOTAXIN-CONTAINING LEUCOTAXINE PREPARATIONS AND OF ANAPHYLATOXIN AND COCYTOTAXIN PROTEINS IN MOLECULARLY HOMOGENEOUS, BIOLOGICALLY ACTIVE FORM

**Josef H. Wissler, Bad Nauheim, Fed. Rep. of Germany, assignor to Max-Planck Gesellschaft Zur Forderung der Wissenschaften, Gottingen, Fed. Rep. of Germany**

**Continuation of Ser. No. 275,014, Jun. 18, 1981, Pat. No. 4,495,096. This application Apr. 6, 1984, Ser. No. 597,810**

**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022914**

**The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.**

**Int. Cl.⁴ C07K *3/20*, *3/28***

**U.S. Cl. 530—380** **64 Claims**

1. In a process for producing and obtaining an anaphylatoxin- and cocytotaxin-containing leucotaxine preparation in biologically active form from contact-activated mammalian serum, the process including separating the proteins from other serum constituents to obtain a serum protein concentrate fraction, separating a part of accompanying foreign blood proteins from anaphylatoxin and cocytotaxin present in said protetin concentrate fraction, and isolating the leocotaxine preparation by chromatography on hydroxyapatite, wherein the improvement comprises separating, prior to chromatography on hydroxyapatite, a major fraction of accompanying foreign blood constituents from said serum protein concentrate by fractional elution or precipitation with a watersoluble alcohol and at least one molecular sieve filtration.

**4,610,816**

## SUBSTITUTED DIPEPTIDES AS INHIBITORS OF ENKEPHALINASES

**Joel G. Berger, Verona, N.J., assignor to Schering Corporation, Kenilworth, N.J.**

**Continuation-in-part of Ser. No. 483,463, Apr. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 444,761, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,485, Apr. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 217,621, Dec. 18, 1980, abandoned. This application Jun. 15, 1984, Ser. No. 621,021**

**Claims priority, application European Pat. Off., Dec. 11, 1981, 81110337.3**

**Int. Cl.[4] C07K *5/06***

**U.S. Cl. 549—452** **11 Claims**

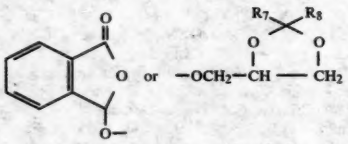
1. A compound having structural formula I

$$R_1C^*H(COR_2)—NH—C^*HR_3—CONH(CH_2)_p—C^*(R_4R_5)—COR_6$$

and the racemates, enantiomers and diastereoisomers thereof and the pharmaceutically acceptable salts thereof, wherein:

$R_1$ is alkyl having from 1 to 6 carbon atoms, adamantylmethyl, cycloalkylmethyl having from 4 to 8 carbon atoms or A—$X_m$—$C_nH_{2n}$— {wherein X is oxygen or sulfur; A is phenyl which may be substituted with the group Y (wherein Y is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, alkyl having from 1 to 6 carbon atoms, 2- or 3-furanyl, 2- or 3- thienyl, or phenyl (which may be substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms)), benzyl (the phenyl ring of which may be substituted with the group Y as defined herein), 1- or 2-naphthyl, 2- or 3-furanyl or 2- or 3-thienyl; m is 0 or 1; and n is 0, 1, 2, 3, or 4};

$R_2$ and $R_6$ may be the same or different and each is independently selected from hydroxy, alkoxy having from 1 to 8 carbon atoms, B—$X_m$—$C_nH_{2n}$—O— {wherein B is phenyl (which may be substituted with the group Y as defined herein) or 1- and 2- naphthyl; and X, m, and n are as defined herein provided that, when n=0, m is zero}, —$OCH_2OCO$-alkyl having from 3 to 8 carbon atoms, —$OCH_2CO$—phenyl {the phenyl ring of which may be substituted with the group Y as defined herein}, 1-glyceryl,



{wherein $R_7$ is hydrogen, alkyl having from 1 to 6 carbon atoms, or phenyl which may be substituted with the group Y as defined herein, and $R_8$ is hydrogen or alkyl having from 1 to 6 carbon atoms};

$R_2$ may also be —$NR_7R_8$ wherein $R_7$ and $R_8$ are as defined herein;

$R_3$ is alkyl having from 1 to 6 carbon atoms, cycloalkylmethyl having from 4 to 8 carbon atoms, 2- or 3-thienylmethyl, 2- or 3-furanylmethyl, 1- or 2-naphthylmethyl, or benzyl the phenyl ring of which may be substituted with the group Y as defined herein;

$R_4$ is D—$C_nH_{2n}$—$O_m$— wherein D is selected from hydrogen, alkyl having from 1 to 4 carbon atoms or phenyl which may be substituted with the group Z; {wherein Z is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, or alkyl having from 1 to 6 carbon atoms}; and m and n are as defined herein;

$R^4$ may also be —$NR_5COR_7$ {wherein $R_5$ and $R_7$ are as defined herein}, or —$NR_5CO_2R_9$ {wherein $R_5$ is defined herein and $R_9$ is alkyl having from 1 to 6 carbon atoms or phenyl which may be substituted with the group Y as defined herein};

$R_5$ is hydrogen or alkyl having from 1 to 6 carbon atoms; and

p is 1 or 2.

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**4,610,817**

## N-ACYL DERIVATIVES OF PEPTIDES, THEIR PREPARATION AND THEIR USE IN THE TREATMENT OF DISORDERS, AND AGENTS FOR THIS PURPOSE

**Hans P. Albrecht, Weinheim, and Horst Kreiskott, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 12, 1983, Ser. No. 513,023**

**Int. Cl.[4] A61K *37/02*; C07K *5/02***

**U.S. Cl. 514—2** **6 Claims**

1. A compound of the formula I

$$X—NH—CR^2R^3—CO—NH—CH_2—CO—R^1 \quad \text{I}$$

where $R_1$ is $NH_2$, $R_2$ is phenyl or naphthyl and $R_3$ is $C_1$-$C_5$-alkyl, or $R_2$ and $R_3$ form a cycloalkyl of 3 to 6 carbon atoms, and X is pyrrol-2-yl carbonyl, L-pyrrolidin-2-ylcarbonyl, L-4,5-dehydropyrrolidin-2-ylcarbonyl, and its salts with physiologically tolerated acids.

3. The method of treating depression in a patient suffering therefrom, which comprises administering to the patient an antidepressive effective amount of a compound according to claim 1.

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**4,610,818**

## N-ACYL DERIVATIVES OF DIPEPTIDES, THEIR PREPARATION AND THEIR USE IN THE THERAPY OF DISORDERS, AND AGENTS FOR THIS PURPOSE

**Hans P. Albrecht, Weinheim, and Horst Kreiskott, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 12, 1983, Ser. No. 513,052**

**Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226242**

**Int. Cl.[4] A61K *37/02*; C07K *5/02***

**U.S. Cl. 514—19** **6 Claims**

1. A compound of the formula I

$$X\text{-}CO\text{-}L\text{-}Leu\text{-}NH\text{-}CH_2\text{-}CO\text{-}R \quad \text{I,}$$

where X is a saturated or unsaturated 5-membered or 6-membered heterocyclic ring containing not more than 1 heteroatom, said heteroatom consisting of nitrogen but where X cannot be pyrrolidin-2-yl, and R is $NH_2$, and its salts with physiologically tolerated acids.

3. The method of treating depression is a patient suffering therefrom, which comprises adminstering to the patient an antidepressive effective amount of a compound according to claim 1.

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**4,610,819**

## PROCESS FOR THE PREPARATION OF AROMATIC-1,4-OXAZEPINONES AND THIONES

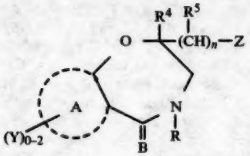
**Young S. Lo, Richmond, and Albert D. Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.**

**Filed Sep. 19, 1984, Ser. No. 652,017**

**Int. Cl.[4] C07D *267/14*, *281/10*, *498/04*, *513/04*, *413/06*, *417/06***

**U.S. Cl. 540—488** **6 Claims**

1. A process for the preparation of a compound of the formula:



wherein:

A represents an aromatic ring having two of its carbon atoms held mutually with the oxazepine moiety selected from the group consisting of benzene, naphthalene, quinoline or pyridine, any of the rings optionally substituted by one or two Y radicals selected from the group consisting of halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro or trifluoromethyl;

B is selected from oxygen or sulfur;

R is selected from the group consisting of hydrogen, loweralkyl, cycloalkyl or phenylloweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro or trifluoromethyl;

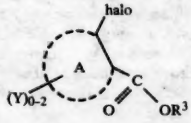
n is 1, 2 or 3;

$R^4$ and $R^5$ are selected from hydrogen or loweralkyl (1–5 C);

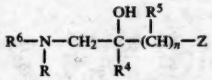
Z is selected from the group consisting of $—NR^1R^2$, 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl;

$R^1$ and $R^2$ are selected from the group consisting of loweralkyl, cycloalkyl and phenyl-loweralkyl of which phenyl may be optionally substituted by 1 or 2 radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or $R^1$ and $R^2$ taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted piperidin-1-yl, 4-[bis(4-fluorophenyl)methyl]-piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted-piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 2,5-dihydro-1H-pyrrolo-1-yl, or 1H-pyrrol-1-yl, and the pharmaceutically acceptable acid addition salts thereof, which comprises the steps of

(Step 1) reacting an aromatic compound of the formula:

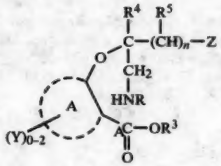


where A represents an aromatic ring selected from benzene, naphthalene, pyridine or quinoline, any of the rings optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro or trifluoromethyl, and $R^3$ is selected from hydrogen, an alkali-metal or an esterifying group with an alkanolamine compound of the formula:



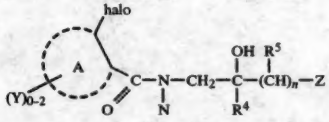
wherein Z, R, $R^4$, $R^5$ and n are as defined above and $R^6$ is hydrogen or an amine protecting group using one of the following conditions (a) or (b):

(a) firstly, reacting said alkanolamine or said alkanolamino having a protected or unprotected secondary amine function with a strong alkali-metal non-nucleophilic base, and secondly, reacting the product thereof with said aromatic compound and deprotecting the secondary amine function if present to give a compound of the formula:



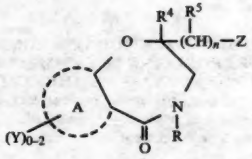
wherein A, Z, Y, R, $R^3$, $R^4$, $R^5$ and n have the starting values; or

(b) reacting said aromatic compound wherein $R^3$ is an alkali-metal ion with said alkanol amine in the presence of a dehydrating agent or a condensation agent to give a compound of the formula:



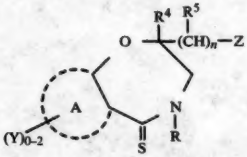
wherein A, Z, Y, $R^4$, $R^5$ and n have the starting values;

Step 2, cyclizing a compound prepared in Step 1 to give a compound of the formula:



wherein A, Z, Y, R, $R^4$, $R^5$ and n have the starting values; and

Step 3, optionally, when desired, reacting a compound prepared in Step 2 with a sulfurizing agent to give a compound of the Formula:



wherein Y, Z, A, R, $R^4$, $R^5$ and n have the starting values.

3. The process of claim 1 wherein the compound prepared is 2-[2-(dimethylamino)ethyl]-2,3-dihydro-4-methyl-1,4-oxazepino[6,7-c]quinolin-5(4H)-one or a pharmaceutically acceptable acid addition salt thereof.

4,610,820

## PROCESS FOR THE PREPARATION OF THIENAMYCIN AND INTERMEDIATES

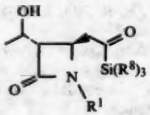
Burton G. Christensen, Scotch Plains; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 486,571, Apr. 19, 1983, abandoned, which is a division of Ser. No. 226,996, Jan. 21, 1981, Pat. No. 4,400,373, which is a continuation of Ser. No. 59,844, Jul. 23, 1979, abandoned. This application Oct. 11, 1985, Ser. No. 786,366

Int. Cl.[4] C07D *205/08*

U.S. Cl. 540—200 2 Claims

1. A compound having the formula:



wherein $R^1$ is a protecting group against N-alkylation or N-acylation, said group being removable under aqueous acidic hydrolysis, and $R^8$ is lower alkyl having 1–6 carbon atoms or phenyl.

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4,610,821

## 4-SUBSTITUTED-2-AZETIDINONE COMPOUND, PROCESS OF PRODUCING THE COMPOUNDS, AND MEDICAMENTS CONTAINING THE COMPOUNDS

Toshinari Tamura, Tokyo; Hidenori Iwamoto; Makoto Yoshida, both of Saitama, and Minoru Yamamoto, Kanagawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

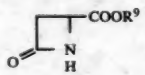
Division of Ser. No. 592,866, Mar. 23, 1984, Pat. No. 4,564,609. This application Oct. 7, 1985, Ser. No. 785,168

Claims priority, application Japan, Mar. 25, 1983, 58-48989; Nov. 25, 1983, 58-221469; Nov. 25, 1983, 58-221470

Int. Cl.[4] C07D *205/08, 403/12, 403/14, 413/12*

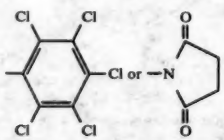
U.S. Cl. 540—200 1 Claim

1. A 4-substituted-2-azetidinone compound represented by the formula (X)



(X)

wherein $R^9$ represents



4,610,822

## PROCESS FOR PREPARING 6-[D(-)-$\alpha$-(4-$C_1$-$C_4$)-ALKYL-2,3-DIOXO-1-PIPERAZINOCARBONYLAMINO)-PHENYLACETAMIDO]PENICILLANIC ACIDS

Donald C. Boop, Bloomsbury, and Karel F. Bernady, Belle Mead, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 248,754, Mar. 30, 1981, abandoned. This application Mar. 12, 1982, Ser. No. 357,431

Int. Cl.[4] C07D *499/04*

U.S. Cl. 540—316 4 Claims

1. In a process for preparing a 6-[D(-)-alpha-(4-$C_1$–$C_4$ alkyl-2,3-dioxo-1-piperazinocarbonylamino)phenylacetamido]-penicillanic acid wherein a 4-$C_1$–$C_4$ alkyl-2,3-dioxo-1-piperazinocarbonyl halide is added to a solution or suspension of ampicillin in a mixture of ethyl acetate and water in the presence of a base to form a reaction mixture, the resulting mixture is agitated until the reaction is completed, the reaction mixture is acidified, and a crystalline product is recovered therefrom; the improvement which comprises:

(a) adding about 1.05–1.15 molar proportions of the 4-ethyl-2,3-dioxo-1-piperazinocarbonyl halide to an agitated suspension of about one molar proportion of ampicillin or ampicillin trihydrate and about 2.5–2.7 molar equivalent of a base in a solvent mixture consisting of about 10–11 parts by weight of water and about 4–6 parts by weight of ethyl acetate per part by weight of ampicillin (or equivalent amount of ampicillin trihydrate) over a period of about 40–60 minutes at about 12°–18° C. while maintaining a pH of about 6.5–8;

(b) further agitating the reaction mixture at about 12°–18° C. for about 20–30 minutes upon completing the addition of the 4-ethyl-2,3-dioxo-1-piperazinocarbonyl halide in Step (a);

(c) adding to the reaction mixture about 0.08–0.1 part by weight of an activated carbon and about 0.1–0.15 part by weight of a filter-aid per part by weight of ampicillin charged in Step (a), and agitating the resulting mixture at about 12°–18° C. for about 15–20 minutes;

(d) clarifying the resulting mixture, and washing the insoluble materials with about 1.0–1.2 parts by weight of water per part by weight of ampicillin charged in Step (a);

(e) combining the mother liquor and wash liquor obtained in Step (d) with about 6–7 parts by weight of ethyl acetate per part by weight of ampicillin charged in Step (a), and the resulting mixture is warmed to about 18°–22° C., with the proviso that the total amount of ethyl acetate used in Steps (a) and (e) is about 11–12 parts by weight per part by weight of said ampicillin;

(f) acidifying the mixture obtained in Step (e) at about 18°–22° C. to a pH of about 2.2–2.3;

(g) agitating the acidified mixture for at least one hour at about 18°–22° C. for about 2–3 hours before the crystalline free acid is collected, washed with water and dried; and

(h) optionally converting the free acid to a pharmaceutically acceptable salt.

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4,610,823

## PROCESS FOR PREPARING SUBSTITUTED 2-THIOXOPENAMS AND 2-SUBSTITUTED THIOPENEMS

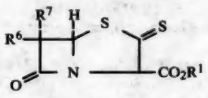
Frank P. DiNinno, Old Bridge; William J. Leanza, Berkeley Heights, and Ronald W. Ratcliffe, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 25, 1983, Ser. No. 460,729

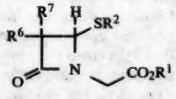
Int. Cl.[4] C07D *499/04;* A61K *31/425*

U.S. Cl. 540—350 8 Claims

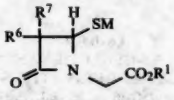
1. A process for preparing:



consisting essentially of the steps of treating:



with a thiophilic metal reagent selected from the group consisting of salts of silver, mercury and thallium to produce:

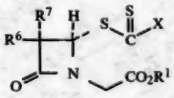


followed by treating with a halothiocarbonate ester of the formula:

wherein:

X' is chloro, bromo, and X is phenoxy, phenylthio, alkylthio, having 2–7 carbon atoms

to yield:



followed by cyclizing in the presence of base; wherein:

$R^6$ and $R^7$ are independently selected from: hydrogen; $R^9NH$—($R^9$ is acyl or H); substituted and unsubstituted: alkyl, alkenyl, alkynyl, having 1–6 carbon atoms; phenyl; heterocyclyl, heteroaryl, having 1–4 heteroatoms selected from O,N,S; cycloalkyl, and cycloalkenyl; wherein said substituent or substituents are selected from: halo (chloro, bromo, fluoro, iodo), hydroxyl, cyano, carboxyl, amino, and the above-recited values for $R^6/R^7$;

$R^2$, is a group which potentially forms a stable carbonium ion; M is a thiophilic metal selected from the group consisting of silver, mercury and thallium; and $R^1$ is a removable protecting group, or a pharmaceutically acceptable ester moiety;

X is a leaving group.

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**4,610,824**

## HYDRAZIDE DERIVATIVES OF MONOCYCLIC BETA-LACTAM ANTIBIOTICS

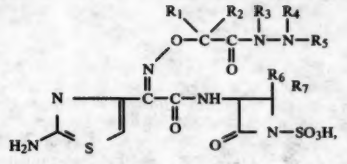
**Uwe D. Trüner, Regensburg, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Oct. 9, 1984, Ser. No. 658,849**

**Int. Cl.**[4] **C07D** *417/014, 417/12;* **A61K** *31/425, 31/495*

**U.S. Cl. 540—355** **11 Claims**

**1. A compound having the formula**

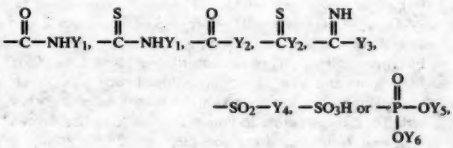


or a pharmaceutically acceptable salt thereof, wherein

$R_1$ and $R_2$ are each independently hydrogen or alkyl of 1 to 4 carbon atoms, or $R_1$ and $R_2$ together with the carbon atom to which they are attached form a cycloalkyl ring;

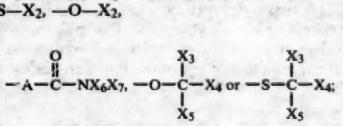
$R_3$ is hydrogen or alkyl;

$R_4$ is hydrogen or alkyl, and $R_5$ is hydrogen, alkyl, phenyl, substituted phenyl, a 4,5,6 or 7-membered heterocycle, phenylalkyl, (substituted phenyl)alkyl, (4,5,6 or 7-membered heterocycle)alkyl,



or together $R_4$ and $R_5$ are $=CH—Y_7$; wherein $Y_1$ is hydrogen, alkyl, phenyl, substituted phenyl, methylcarbonyl, trifluoromethylcarbonyl, phenylcarbonyl, (substituted phenyl)carbonyl, carboxymethyl, methylsulfonyl, phenylsulfonyl, (substituted phenyl)-sulfonyl, aminocarbonyl, aminocarbonylamino, aminoethyl, hydroxy, alkoxy, amino, alkylamino, dialkylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, 1-pyrrolidinyl or 1-piperidinyl; $Y_2$ is hydrogen, alkyl, phenyl, substituted phenyl, a 4,5,6 or 7-membered heterocycle, alkoxy, formyl, carbonyl, aminocarbonyl, aminothiocarbonyl, methylaminocarbonyl, methylaminothiocarbonyl, trifluoromethyl, phenylmethyl, (substituted phenyl)-methyl, phenyloxymethyl, (substituted phenyl)oxymethyl, cyanomethyl, hydroxymethyl, alkoxymethyl, aminomethyl, methylcarbonylaminomethyl, aminocarbonylaminomethyl, methylsufonylaminomethyl, carboxymethyl, aminocarbonylmethyl, alkoxycarbonylmethyl, (4,5,6 or 7-membered heterocycle)-alkyl, hydroxyaminocarbonylmethyl, or azidomethyl; $Y_3$ is amino, alkyl, alkylthio, carboxythio, alkoxycarbonylthio or aminocarbonylthio; $Y_4$ is alkyl, amino, hydroxyamino, alkoxyamino, methylcarbonylamino, or phenylcarbonylamino; $Y_5$ is hydrogen or alkyl; $Y_6$ is hydrogen, alkyl, carboxymethyl, or aminocarbonylmethyl; and $Y_7$ is phenyl or substituted phenyl;

$R_6$ and $R_7$ are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4,5,6 or 7-membered heterocycle, or one of $R_6$ and $R_7$ is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethylnyl, carboxyl, $—CH_2X_1$, $—S—X_2$, $—O—X_2$,



wherein $X_1$ is azido, amino, hydroxy, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substi-

tuted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,

—S—$X_2$ or —O—$X_2$; $X_2$ is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; one or $X_3$ and $X_4$ is hydrogen and the other is hydrogen or alkyl, or $X_3$ and $X_4$ when taken together with the carbon atom to which they are attached form a cycloalkyl group; $X_5$ is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkyl- carbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is —CH=CH—, —$(CH_2)_n$—, —CH$_2$—O—, —$CH_2$—NH— or —$CH_2$—S—$CH_2$—; n is 0, 1 or 2; and $X_6$ and $X_7$ are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or $X_6$ is hydrogen and $X_7$ is amino, substituted amino, alkanoylamino or alkoxy, or $X_6$ and $X_7$ when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, alkoxy, phenyloxy, (substituted phenyl)oxy, (4,5,6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

the term "substituted amino" refers to a group having the formula —$NZ_1Z_2$ wherein $Z_1$ is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and $Z_2$ is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4,5,6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolylidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups.

## 4,610,825
## PHOSPHOROUS ACID CATALYZED PHENOL ESTERIFICATION

**Ned M. Rockwell, Gurnee, Ill., assignor to Stepan Company, Northfield, Ill.**

**Filed Apr. 17, 1985, Ser. No. 724,172**
**Int. Cl.[4] C09F *5/08, 7/10;* C11C *3/00;* C07C *67/08***
**U.S. Cl. 260—410.5** **12 Claims**

1. In a process for making a phenyl ester of a carboxylic acid, by heating a mixture of an organic carboxylic acid with a phenol compound in the presence of a catalyst while removing water from the so heated mixture, the improvement which comprises employing as said catalyst a catalytically effective amount of a material selected from the group consisting of (a) a phosphorous acid compound containing the combination of P—H, P=O and P—O—H bonds, (b) phosphite salts which display an acidic pH in aqueous solution, and (c) mixtures thereof.

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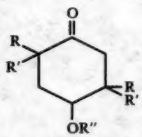
## 4,610,826
## TETRA-ALKYL-2,2,5,5-CYCLOHEXANONE-4-OL-1 AND SULPHONYLATED DERIVATIVES THEREOF

**Jean D'Angelo, Massy; Gilbert Revial, Paris; Robert Azerad, Ris Orangis, and Didier Buisson, Maintenon, all of France, assignors to Roussel Uclaf, Paris, France**

**PCT No. PCT/FR84/00096, § 371 Date Dec. 5, 1984, § 102(e) Date Dec. 5, 1984, PCT Pub. No. WO84/04090, PCT Pub. Date Oct. 25, 1984**
**PCT Filed Apr. 9, 1984, Ser. No. 691,525**
**Claims priority, application France, Apr. 8, 1983, 83 05772**
**Int. Cl.[4] C07C *49/403, 143/20***
**U.S. Cl. 558—44** **5 Claims**

1. A compound selected from the group consisting of tetra-alkyl-2,2,5,5-cyclohexanone-4-ol-1 compounds and their sulphonyl derivatives of the formula I:



(I)

in which each of R and R' are individually an alkyl radical having from 1 to 5 carbon atoms, and R" represents a hydrogen atom or a $SO_2R'''$ radical, in which R''' is selected from the group consisting of alkyl of 1 to 5 carbon atoms, phenyl and alkylphenyl having up to 14 carbon atoms.

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## 4,610,827
## AMINO ACID COMPLEX AND A METHOD FOR OPTICAL RESOLUTION OF A DL-AMINO ACID

**Toshihide Yukawa, Yokohama; Toru Ikeda; Shinichi Kishimoto, both of Yokkaichi, and Katsumi Sugiyama, Yokosuka, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan**

**Filed Jul. 10, 1984, Ser. No. 629,468**
**Claims priority, application Japan, Jul. 22, 1983, 58-133991**
**Int. Cl.[4] C07C *103/50;* C07B *57/00***
**U.S. Cl. 260—501.11** **5 Claims**

1. A complex of an optically active amino acid and an optically active N-acyl aspartic acid.

3. A method for optical resolution of a DL-amino acid comprising reacting the DL-amino acid and an optically active N-acyl aspartic acid in a solvent or a solvent mixture, and separating the resulting two types of diastereomers by means of the difference between their solubilities in said solvent or said solvent mixture.

4,610,828

## PROCESS FOR PREPARING L-CARNITINE AND SALTS THEREOF

Haruhiko Kikuchi, Kamifukuoka, Japan, assignor to Nisshin Flour Milling Co., Ltd. and Nisshin Chemicals Co., Ltd., both of, Japan

Filed Oct. 3, 1985, Ser. No. 783,872
Claims priority, application Japan, Oct. 9, 1984, 59-210442
Int. Cl.[4] C07B 57/00
U.S. Cl. 260—501.13 8 Claims

1. A process for preparing L-carnitine and the salts thereof which comprises reacting DL-carnitine with dibenzoyl-L(+)tartaric acid as a resolving agent to form dibenzoyl-L(+)tartarates of D-carnitine and L-carnitine, fractionally crystallizing from said tartarates dibenzoyl-L(+)tartarate of L-carnitine, and subsequently decomposing the tartarate to give L-carnitine, and if necessary converting it to the salts thereof.

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4,610,829

## POLYFLUORINATED SULPHONIC ACIDS AND THEIR DERIVATIVES

Jean-Pierre Lalu, La Mulatiere, and Louis Foulletier, Oullins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 312,880, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 851,081, Aug. 18, 1969, abandoned. This application Dec. 4, 1978, Ser. No. 966,508
Claims priority, application France, Aug. 21, 1968, 163,587
Int. Cl.[4] C07C 143/70
U.S. Cl. 260—543 R 10 Claims

1. A product having the formula $C_nF_{2n+1}(CH_2)_b—SO_2—Z$ wherein $C_nF_{2n+1}$ represents a straight or branched perfluorinated hydrocarbon chain, n is a number between 1 and 20, b is a number between 2 and 20 and Z is a chlorine or bromine atom.

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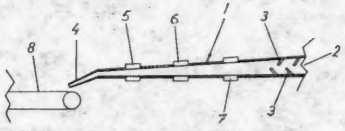
4,610,830

## PROCESS FOR CONTINUOUS PRODUCTION OF A FIBROUS, BONDED MATERIAL DIRECTLY FROM A POLYMERIC SOLUTION

Henry Zöller, Koppargatan 23, S-42171 Västra Frölunda, Sweden

Filed Sep. 11, 1984, Ser. No. 649,417
Claims priority, application Sweden, Sep. 19, 1983, 8305028
Int. Cl.[4] B01J 2/04, 2/18; B29B 9/00; B06B 1/20
U.S. Cl. 264—9 4 Claims



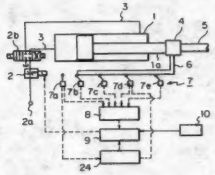

1. A process for continuous production of fibrous bonded material directly from a polymeric solution, comprising feeding a said solution through a flow duct, inducing turbulence in said solution through said duct, cooling the solution in the duct, subjecting the solution in the duct to vibrations after inducing said turbulence, and ejecting the solution from the duct.

4,610,831

## METHOD OF CONTROLLING CYLINDER SPEED IN INJECTION MOLDING APPARATUS

Takeshi Mihara, Ube, Japan, assignor to UBE Industries, Yamaguchi, Japan

Filed Apr. 5, 1984, Ser. No. 597,231
Claims priority, application Japan, Apr. 12, 1983, 58-63004
Int. Cl.[4] B29C 45/77; B22D 46/00
U.S. Cl. 264—40.7 4 Claims




1. A method for controlling the speed of an injection piston in an injection molding or die casting apparatus of the type including a cylinder within which the piston slides and which is to be filled with a melt, a hydraulic pressure circuit including the piston for casting the melt in the cylinder, and a flow rate adjusting valve having a variable opening actuated by a flow rate adjusting signal for adjusting the flow rate of a liquid used for controlling movement of the piston, the speed of the piston being changed to different desired values at different positions during the molding operation by controlling the flow rate adjusting valve, said method comprising the steps of:

determining delay times occurring in movement of the piston from one speed to another and producing a delay signal in response thereto; and

varying the length of stroke of the piston during the injection stroke in response to said delay signal to compensate for said delay times, such that the speed of movement of the piston is changed to predetermined values at predetermined positions during the molding operation.

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4,610,832

## PROCESS FOR PREPARING A CERAMIC FOAM

Jerry W. Brockmeyer, Hendersonville, N.C., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 26, 1984, Ser. No. 654,391
Int. Cl.[4] B29C 71/02
U.S. Cl. 264—44 13 Claims

1. A process for preparing a ceramic foam filter for filtering molten metal which comprises: providing a reticulated, organic polymer foam; impregnating said foam with an aqueous slurry of a thixotropic ceramic composition including a gelled alumina hydrate binder in an amount of from 3 to 15%; drying and heating said impregnated polymer foam to remove the organic component therefrom; and firing at an elevated temperature to produce a solid state, sintered ceramic bond characterized by being substantially binder free and substantially free of glassy phases.

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4,610,833

## PROCESS FOR PREPARING BIAXIALLY STRETCHED POLYESTER FILMS

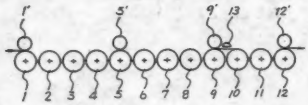
Tateo Kanesaki, Nagahama; Shigeo Utsumi, Yokohama, and Kichinojyo Tomitaka, Kawasaki, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

PCT No. PCT/JP83/00306, § 371 Date Apr. 18, 1984, § 102(e) Date Apr. 18, 1984
PCT Filed Sep. 14, 1983, Ser. No. 606,780
Int. Cl.[4] B29C 55/14
U.S. Cl. 264—235.8 8 Claims

1. A process for preparing a uniformly flat and slippery biaxially stretched film, which comprises the steps of:

(a) subjecting an unstretched polyester film to a first stage single longitudinal stretching to attain a $\Delta n$ value of 0.030–0.055,

(b) subjecting said polyester film to a later stage longitudinal stretching at a temperature of from 95° C. to 150° C. to




attain a $\Delta n$ value of not more than 0.080, an $\bar{n}$ of not more than 1.600, and a stretching ratio of from 1.05 to 1.7,

(c) stretching said polyester film transversely, and

(d) finally, heat setting said polyester film at a temperature between 180° C. and 245° C., wherein between steps (c) and (d) there are no intervening steps.

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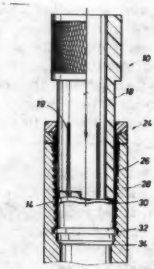
**4,610,834**

## APPARATUS AND METHOD FOR INSTALLING INTERNAL ANNULAR RINGS IN TUBULAR BOX MEMBERS

**Burwell E. Baron, Houston; Gary E. Kirsch, Tomball, and Keith C. Mott, Houston, all of Tex., assignors to Hydril Company, Houston, Tex.**

**Filed Sep. 26, 1985, Ser. No. 780,374**
**Int. Cl.[4] B29C *65/00*; B28B *11/00***
**U.S. Cl. 264—249** **10 Claims**




1. The method of inserting and seating a corrosion barrier ring having poor plastic memory into a threaded tapered tubular box member having a groove behind its last thread for receiving the corrosion barrier ring, which comprises the steps of

inserting a frusto-conical metallic guide sheet liner into said box member having at least approximately the same longitudinal taper as the box member to cover the thread area while leaving the corrosion barrier groove uncovered,

inserting the corrosion barrier ring through said metallic sheet liner to align the corrosion barrier ring opposite the corrosion barrier groove using a mandrel, that has an end with spaced peripheral notches therein that inhibits excessive radial deformation of the corrosion barrier ring while permitting axial and radial deformation of the corrosion barrier ring into said notches, the unnotched end of the mandrel being approximately the same diameter dimension as the corrosion barrier ring so that the corrosion barrier ring does not slip over the end of said mandrel, the unnotched portion of the end of said mandrel having an outside diameter only slightly smaller than the inside diameter of the entrance of the corrosion barrier groove, and

rotating the mandrel to force the corrosion barrier ring into the corrosion barrier groove by straightening of the axial and radial deformations in the corrosion barrier ring as the mandrel is rotated and the unnotched end of the mandrel is rotated past the axial deformations.

4. Apparatus for inserting and seating a corrosion barrier corrosion barrier ring having poor plastic memory into a threaded, tapered tubular box member having a groove behind its last thread for receiving the corrosion barrier ring, comprising

a frusto-conically shaped metallic guide liner having a longitudinal taper approximately the same as the taper of the threaded box member and a length which is sufficient to cover the threads of the box member without covering the corrosion barrier groove, and

an elongate, annular mandrel longer than said liner length having an end with spaced peripheral notches therein that permits axial and radial deformation of the corrosion barrier ring while inhibiting excessive radially deformation of the corrosion barrier ring, the unnotched end of the mandrel being approximately the same diameter dimension as the corrosion barrier ring so that the corrosion barrier ring does not slip over the end of said mandrel whereby rotating the mandrel forces the corrosion barrier ring into the corrosion barrier groove by straightening of the axial and radial deformations in the corrosion barrier ring as the mandrel is rotated and the unotched end of the mandrel is rotated past the axial deformations.

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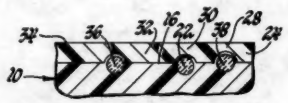
**4,610,835**

## METHOD OF PRODUCING GLASS FIBER MAT REINFORCED PLASTIC PANELS WITH SMOOTH SURFACES

**Hamid Ghavamikia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 9, 1984, Ser. No. 669,824**
**Int. Cl.[4] B28B *9/00***
**U.S. Cl. 264—250** **2 Claims**




1. A method of producing a smooth surface layer on the surface of a premolded glass fiber mat reinforced polyurethane panel situated in a matched mold where protruding fibers produce a rough surface, said method comprising:

positioning said premolded panel in the cavity of the lower mold piece of said matched mold,

coating and leveling off the rough surface of said premolded panel with a liquid mixture of a room temperature curable polyurethane composition such that the thickness of said coating is at least adequate to fill the valleys created between the protruding fibers in the surface, said premolded panel being at room temperature prior to and during said coating operation,

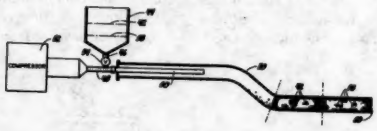
applying sufficient pressure on said coated surface through an upper mold piece positioned on said panel to cause said coating to fill the valleys between the protruding fibers and to flow evenly to cover the entire surface of said panel, and

relieving said pressure while said coating is still in its fluid state and allowing said coating composition to sufficiently harden under the dead weight of said upper mold piece, whereby the cured coating provides a smooth surface layer on said panel that masks said protruding fibers.

## 4,610,836
## METHOD OF REINFORCING A STRUCTURAL MEMBER

**Joseph S. Wycech, Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 531,058, Sep. 12, 1983, abandoned. This application Nov. 23, 1984, Ser. No. 674,226**
**Int. Cl.[4] B28B *7/30*; B29C *33/78***
**U.S. Cl. 264—313** **3 Claims**



1. A method of reinforcing a selected longitudinal portion of an elongated tubular structural member comprising the steps of:

filling an end portion of said tubular structural member adjacent to said selected longitudinal portion with a volume of heat vaporizable material sufficient to fill the end portion;

coating macrospheres having a diameter of 3 to 9 mm. with a curable adhesive in a quantity effective to bond together adjacent macrospheres and yet leave voids between the macrospheres upon subsequent curing of the curable adhesive, where said macrospheres are composed of bonded together hollow microspheres;

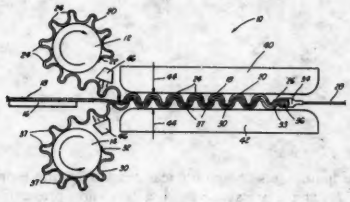
filling said selected longitudinal portion of said tubular structural member with a plurality of said adhesive coated macrospheres in close-packed relationship to engage said tubular structural member, and said heat vaporizable material; and

heating said tubular structural member to vaporize said heat vaporizable material whereby said structural member is reinforced at a selected longitudinal portion thereof and the end portion previously occupied by the heat vaporizable material is restored as an open cavity having airflow communication through the voids between the closely packed bonded together macrospheres.

## 4,610,837
## APPARATUS AND METHOD FOR FORMING A CORRUGATED SHEET FROM A FLAT THERMOPLASTIC SHEET

**Luther R. Frey, Peck, Kans., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jan. 3, 1984, Ser. No. 567,772**
**Int. Cl.[4] B29C *53/28***
**U.S. Cl. 264—339** **7 Claims**



1. An apparatus for receiving and forming a flat thermoplastic sheet into an irregular sheet, the apparatus comprising:

a first rewind drum;

a second rewind drum disposed in a spaced relationship from the first rewind drum;

a first flexible metal tool sheet, one end of the sheet attached to the first rewind drum and wrapped therearound, the other end of the tool sheet attached to a pull cable;

a second flexible metal tool sheet, one end of the tool sheet attached to the second rewind drum and wrapped therearound, the other end attached to the pull cable;

a flat stationary upper tool press plate; and

a flat stationary lower tool press plate, the pull cable received between the upper tool plate and the lower tool plate, the pull cable pulling the first and second tool sheets and the flat thermoplastic sheet between the upper tool plate and the lower tool plate and forming and cooling the flat thermoplastic sheet.

7. A method for forming a flat thermoplastic sheet into a corrugated sheet, the steps including:

heating a pair of metal corrugated tool sheets mounted on rewind drums;

inserting a flat thermoplastic sheet between the two metal tool sheets.,

pulling the two corrugated metal tool sheets between a stationary upper tool press plate and a stationary lower tool press plate with the flat sheet therebetween;

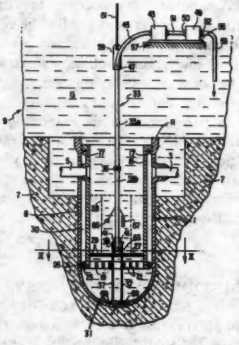
compressing and forming the flat sheet into a corrugated sheet as the metal tool sheets are compressed between the upper tool plate and lower tool plate; and

cooling the corrugated thermoplastic sheet between the upper and lower tool plates.

## 4,610,838
## METHOD FOR REMOVING DEBRIS FROM A NUCLEAR REACTOR VESSEL

**Michael R. Gasparro, Penn Hills, and Anthony P. Besterci, Jr., Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 26, 1984, Ser. No. 634,726**
**Int. Cl.[4] G21C *17/00, 19/42***
**U.S. Cl. 376—248** **6 Claims**



1. A method for extracting debris from the bottom of a water-filled nuclear reactor vessel having an open upper end and containing a plurality of nuclear fuel assemblies, upper reactor internals disposed above the fuel assemblies, and a lower core plate supporting the fuel assemblies and having a plurality of flow holes, at least one of which flow holes has a perimeter, imaginary vertical projection lines extending from said perimeter defining an unobstructed volume between the lower core plate and the bottom of the vessel, and wherein a closure head is provided for closing the upper end of the vessel, said method comprising:

removing the closure head, upper internals, and at least some fuel assemblies from the reactor vessel to expose said at least one flow hole;

lowering a pipe having an open free end into the vessel so that the pipe extends through said exposed flow hole, and

has its free end in close proximity to the bottom of the vessel;

applying suction to the end of the pipe remote from the open free end to withdraw water and debris from the bottom of the vessel through the pipe; and

removing the debris from the water withdrawn from the vessel and discharging the debris-free water into a reservoir.

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**4,610,839**

## STORAGE CONTAINER AND CARRYING PEG FOR RADIOACTIVE MATERIAL

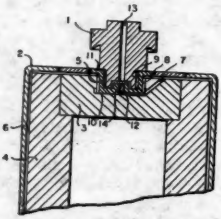
**Rolf Geier, Bruchkobel, and Berthold Racky, Nidderau, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany**

**Filed Dec. 23, 1983, Ser. No. 565,003**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 82363595[U]**

**Int. Cl.⁴ G21C *19/00***

**U.S. Cl. 376—272** **16 Claims**



1. A storage container for radioactive material, especially for spent fuel element from nuclear reactors comprising a base body provided with a cover, a jacket for the cover and the base body disposed on the outside thereof and made of a corrosion-resistant material and further including a carrying apparatus in the form in the form of a carrying peg, said peg including a body having, at one end, external threads and, adjacent the opposite end, a peripheral flange extending generally transversely of said body to facilitate grasping and holding of said peg, a cylindrically shaped recess in the cover, a sleeve inset recess and, in said sleeve said carrying peg having said threaded end threadly engaged, with the sleeve and the jacket being made of the same material.

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**4,610,840**

## FISSION PRODUCT SCRUBBING SYSTEM FOR A NUCLEAR REACTOR

**Dirk S. Leach, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Dec. 27, 1984, Ser. No. 686,770**

**Int. Cl.⁴ G21C *9/00***

**U.S. Cl. 376—283** **7 Claims**

1. A fission product scrubbing system for a nuclear reactor including a containment building defining a containment space for accommodating reactor components, comprising

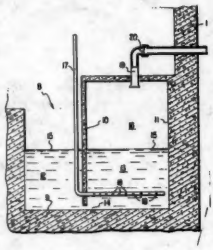
(a) means defining a water tank in said containment building;

(b) a dividing wall extending into said water tank for separating said water tank into a first and a second compartment; said first compartment being in an open communication with the containment space, whereby water stored in said first compartment has a water level directly exposed to the atmosphere in the containment space;

(c) means defining a collection plenum normally hermetically sealed from the containment space and the environment externally of said containment building; said means defining said collection plenum being at least in part formed by said dividing wall and the level of water stored in said second compartment;

(d) means defining a communication passage in said dividing wall underneath the water level in said first and second compartments for maintaining communication between the water stored in said first and second compartments;

(e) a standpipe extending from said containment space into said second compartment; said standpipe having an opening situated in said containment space and flow distribution holes situated in said second compartment below the water level therein and at a height above that of said communication passage whereby gases passing from said



containment space into said standpipe travel upwardly from said distribution holes through the water into said collection plenum;

(f) a vent pipe extending from said collection plenum into the environment externally of said containment building; and

(g) a rupture disc mounted in said vent pipe for normally blocking communication between said collection plenum and the environment; said rupture disc being designed for blowing out in response to a predetermined pressure below the containment failure pressure prevailing in said collection plenum to provide for a free passage of gases from the collection plenum towards the atmosphere through said vent pipe.

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**4,610,841**

## CORROSION PREVENTING DEVICE FOR IN-PILE STRUCTURES OF HELIUM GAS-COOLED REACTOR

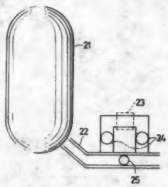
**Masao Yamada, and Haruo Kawakami, both of Kanagawa, Japan, assignors to Fuji Electric Company Ltd., Kanagawa, Japan**

**Filed Feb. 22, 1984, Ser. No. 582,519**

**Claims priority, application Japan, Feb. 22, 1983, 58-28355**

**Int. Cl.⁴ G21C *9/00***

**U.S. Cl. 376—305** **5 Claims**



1. In a helium gas-cooled nuclear reactor having a primary cooling gas and a pressure vessel, a corrosion preventing device, comprising: an oxidation product consuming member comprising a material having a high affinity for oxidizing impurities at an elevated temperature, said oxidation product consuming member being a member selected from the group consisting of a bundle of rods and a cylinder having a large number above the temperature of said primary cooling gas of through holes formed therein in a honeycomb pattern in the

lengthwise direction and a large number of balls; and means for heating said oxidation product consuming member,said oxidation product consuming member and said heating member being incorporated in a pipe, said device being interposed in series with a primary cooling gas supply pipeline or as a bypass of said primary cooling gas supply pipeline of said reactor.

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**4,610,842**

**FUEL ROD FOR A NUCLEAR REACTOR**

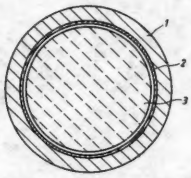
**Katarina L. Vannesjö, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden**

**Filed Mar. 28, 1984, Ser. No. 594,320**

**Claims priority, application Sweden, Mar. 30, 1983, 8301770**

**Int. Cl.⁴ G21C *3/00***

**U.S. Cl. 376—416** **5 Claims**




1. In a nuclear reactor fuel rod which comprises a cladding tube, a nuclear fuel located within said cladding tube, said cladding tube being lined internally with an internal layer, said cladding tube having a certain thickness and being composed of a zirconium-based alloy which contains, by weight, from about 1.2 to about 1.7 percent of tin, from about 0.07 to about 0.24 percent of iron, from about 0.05 to about 0.15 percent of chromium, from about 0 to about 0.8 percent of nickel and from about 0.09 to about 0.16 percent of oxygen, the balance being zirconium and conventional impurities, said internal layer having a thickness which is less than that of said cladding tube, the improvement wherein said internal layer consists of a zirconium-tin alloy containing 0.1–1 percent by weight of tin, the balance being zirconium and impurities normally present in reactor grade sponge zirconium.

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**4,610,843**

**LOW-ALLOY (NI-SN-TI) COPPER ALLOY**

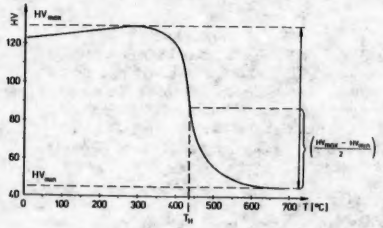
**Jörg Steeb, Tiefenbach, Fed. Rep. of Germany, assignor to Wieland-Werke AG, Ulm, Fed. Rep. of Germany**

**Filed Dec. 21, 1984, Ser. No. 684,563**

**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347535**

**Int. Cl.⁴ C22C *9/02, 9/06***

**U.S. Cl. 420—473** **4 Claims**




1. A low-alloyed copper alloy, consisting of
0.03 to 0.2% nickel by weight;
0.03 to 0.02% tin by weight; and
0.015 to 0.1% titanium by weight; the remainder being copper and common impurities, said alloy having an electrical conductivity of at least 80% IACS.

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**4,610,844**

**METHOD OF MAKING A COEXTRUDATE OF MEAT AND FAT**

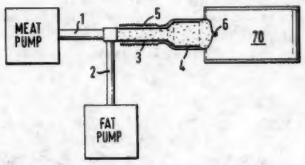
**Bernard T. Matthews, Norwich; David J. Joll, Holt; Habeeb M. Ziauddin, and David N. Wilson, both of Norwich, all of England, assignors to Bernard Matthews plc, Norfolk, England**

**Filed Jan. 25, 1985, Ser. No. 694,760**

**Claims priority, application United Kingdom, Feb. 3, 1984, 8402948; Jan. 18, 1985, 8501291**

**Int. Cl.⁴ A23L *1/317;* A23P *1/12***

**U.S. Cl. 426—641** **10 Claims**




1. A method of manufacturing a simulated natural cut of meat of substantially constant and non-cylindrical cross-section, said method comprising the steps of:
co-extruding from respective regions of a non-cylindrical extrusion head an energised dimensionally unstable co-extrudate comprising a non-cylindrical energised body of whole-muscle meat bearing a layer of fat;
encasing the co-extrudate emerging from the head with a fitting flexible sleeve closed across the front of the head to produce a tight fill of the sleeve with the co-extrudate;
restraining the encased energised dimensionally unstable co-extrudable emerging from the head to preserve a shape imparted by the head by a longitudinally extending array of guides impinging against sides of the encased co-extrudate;
superficially freezing the restrained co-extrudate to impart dimensional stability to it; and
hard freezing the superficially frozen co-extrudate.

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**4,610,845**

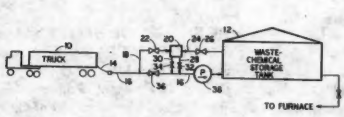
**SYSTEM FOR TESTING CHEMICALS BEFORE MIXING THEM TO AVOID RUN-AWAY REACTIONS**

**Dennis A. Tanberg, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Oct. 29, 1982, Ser. No. 437,662**

**Int. Cl.⁴ G01N *25/20***

**U.S. Cl. 422—51** **3 Claims**




1. A system capable of determining if waste chemicals from a chemical waste transport vessel can be safely emptied into a chemical waste collection vessel already containing an unidentified mixture of waste chemicals without having a run-away exothermic reaction within the chemical waste collection vessel, said system being comprised of:
(A) a chemical waste collection vessel containing an unidentified mixture of waste chemicals;
(B) a chemical waste transport vessel containing waste chemicals which are desired to be emptied into the chemi-

cal waste collection vessel if no run-away exothermic chemical reaction will occur upon the mixing of the chemicals from the chemical waste transport vessel with the chemicals in the chemical waste collection vessel;

(C) a sealed calorimeter;

(D) means for connecting each of said separate vessels with said sealed calorimeter in a manner so that a known sample amount of chemicals from each vessel can be flowed into said calorimeter in order to determine if the chemicals can be mixed in the manner and under the conditions desired without having run-away exothermal reaction in the waste collection vessel; and

(E) means for transferring the bulk of the waste chemicals directly from the chemical waste transport vessel into the chemical waste collection vessel without passing through the calorimeter if the calorimeter has already indicated that the waste chemicals from the transport vessel can be safely mixed with those in the collection vessel; but said system not containing a means for identification and classification of the unidentified mixture of waste chemicals contained in the chemical waste collection vessel.

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**4,610,846**

## COMPARTMENTALIZED CENTRIFUGATION CHAMBER

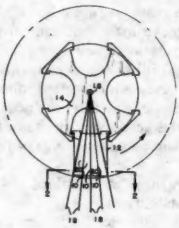
**Hans Martin, Schmidten 2, D-7201 Rietheim-Weilheim 1, Fed. Rep. of Germany**

**Filed Aug. 17, 1984, Ser. No. 642,121**

**Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329873**

**Int. Cl.[4] B01L** *11/00;* **B04B** *5/02*

**U.S. Cl. 422—101** **4 Claims**



1. A compartmentalized centrifugation chamber for holding a sample including a medium and particles dispersed therein, subdivided by partitions into several hydrostatically communicating compartments, said chamber adapted to be carried by a swinging-bucket centrifuge rotor, said partitions substantially being positioned during centrifugation in planes coinciding with centrifugal force lines and further being parallel to the axis of rotation.

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**4,610,847**

## CONVERSION FLASK FOR SEQUENTIAL PERFORMANCE APPARATUS

**Leroy E. Hood, Pasadena; Michael W. Hunkapiller, San Gabriel; William J. Dreyer, Pasadena; Rodney M. Hewick, Pasadena, and Anton W. Stark, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Division of Ser. No. 380,109, May 20, 1982, which is a division of Ser. No. 190,100, Sep. 23, 1980, abandoned. This application Apr. 23, 1984, Ser. No. 602,699**

**Int. Cl.[4] B01J** *19/26;* **G01N** *33/68*

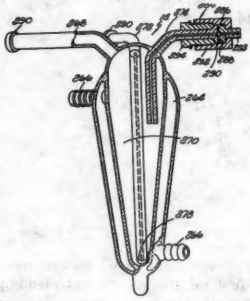
**U.S. Cl. 422—102** **6 Claims**

1. A conversion flask for use in an apparatus for the sequential performance of chemical processes on a sample of chemical material, comprising:

E flask means having at least three capillary tubes extending into the interior thereof for the introduction and withdrawal of various fluids relative thereto and means adapted to be connected to an external vacuum source, said flask means having interior walls, an upper end and a bottom;

a first of said capillary tubes having an inner end at which its bore is closed and which is provided with a plurality of restricted radially spaced orifices such that passage of fluids inwardly through said first of said capillary tubes produces a spray onto the interior walls of the flask in proximity to its upper end to wash down said interior walls;

a second of said capillary tubes terminating at a point adjacent the bottom of the flask in an inner end at which its



bore is closed, said inner end being provided with a plurality of restricted radially spaced orifices such that passage of a gas inwardly through said second of said capillary tubes introduces a plurality of small bubbles into any liquid within the flask, said bubbles serving to agitate said liquid or accelerate drying thereof; and

a third of said capillary tubes terminating at a point above the point of termination of the second capillary tube and below the point of termination of the first capillary tube such that passage of chemical materials inwardly though said third capillary tube and impinging the walls of said flask are washed downwardly by the fluid from said first capillary tube toward the point of termination of said second capillary tube.

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**4,610,848**

## DEVICE FOR THE DOSABLE ADDITION OF A SUBSTANCE TO A SOLVENT

**Klaus Weber, Hildesheim, Fed. Rep. of Germany, assignor to Weber und Springmann, Fed. Rep. of Germany**

**Filed Oct. 26, 1984, Ser. No. 665,300**

**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339420**

**Int. Cl.[4] G05D** *9/00*

**U.S. Cl. 422—106** **29 Claims**

1. A device for the addition of a liquid dosing substance to a solvent comprising

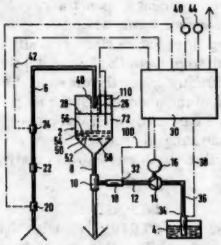
a reservoir for the solvent

an outlet line connected to said reservoir

means for controlling the quantity of solvent discharged from said outlet line which means is responsive solely to

the static pressure of the solvent in the reservoir and includes a level control device mounted in said reservoir

a supply container for the dosing substance



a feed line connecting from said supply container to said outlet line, and

a dosing pump in said feed line.

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**4,610,849**

**REACTOR FOR DRY FLUE GAS DESULFURIZATION**

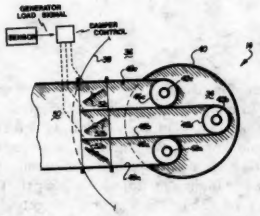
**John Van Camp, Philadelphia, Pa., and Stanley J. Baran, Cherry Hill, N.J., assignors to Proctor & Schwartz, Inc., Horsham, Pa.**

**Continuation-in-part of Ser. No. 279,089, Jun. 30, 1981. This application Jun. 13, 1983, Ser. No. 503,607**

**The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.**

**Int. Cl.[4] B01D *47/00*; F01C *1/00***

**U.S. Cl. 422—111** **9 Claims**



1. A spray reactor assembly particularly suitable for stack gas desulfurization, comprising

a reactor vessel having a longitudinal axis and longitudinally extending confines embracing said axis and defining an enlarged reaction zone;

means defining a head section above said reactor vessel;

an annular array of at least three equally spaced-apart nozzles in said head section oriented longitudinally with respect to said vessel axis and terminating in a plane perpendicular to the vessel axis, said array of nozzles lying within a plane defined by and extending upwardly from said longitudinally extending confines;

means communicating said nozzles with a source of alkaline reagent, including means to control the flow in said nozzles; with the sizing of the reactor vessel and location of nozzles in the head section being effective to avoid coating the reactor walls with alkaline reagent or reactant product;

a plurality of stack gas inlet means, wherein each of said stack gas inlet means is in the form of duct means coaxial with and encompassing at least one of said nozzles;

a gas inlet plenum chamber;

a plurality of bridging duct means, wherein each bridging duct means corresponds with one of said stack gas inlet means and extends between said corresponding one of said stack gas inlet means and said plenum chamber; and

damper means in each of said bridging duct means to open and close such duct means.

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**4,610,850**

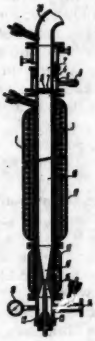
**APPARATUS FOR PRODUCING FIBRIDES OF SYNTHETIC HETEROCHAIN POLYMERS**

**Vladimir A. Nikiforov; Savely A. Zhizhilev; Alexandr G. Mukhometzyanov, all of Kalinin; Lev B. Sokolov, Vladimir; Nison I. Gelperin, Moscow; Tatyana I. Nikitina, Kalinin, and Vikior I. Rabinovich, Leningrad, all of U.S.S.R., assignors to Kalininsky Politekhnichesky Institut USSR, Kalinin, U.S.S.R.**

**Division of Ser. No. 220,810, Dec. 29, 1980, Pat. No. 4,396,758. This application May 16, 1983, Ser. No. 494,727**

**Int. Cl.[4] C08G *59/16***

**U.S. Cl. 422—131** **5 Claims**



1. An apparatus for producing fibrides of synthetic heterochain polymers, comprising:

a cylindrical housing extending in a vertical plane and including an upper end portion, an opposite lower tapered end portion, and an elongated middle section intermediate the upper end portion and the lower end portion and communicating with said upper end and lower end portions;

said upper end portion including a reaction chamber having a cylindrical wall and an open bottom end, and a coaxial shell outside the reaction chamber forming an annular space surrounding and communicating with the reaction chamber via a clearance space between a lower end of the reaction chamber and means located below the lower end of the reaction chamber providing a bottom surface;

first fluid entry means for admitting a first liquid phase reactant into said annular space as a continuous stream, said first entry means oriented in a substantially horizontal plane to discharge the first liquid phase reactant in a substantially horizontal direction;

the lower tapered end portion of the housing including second fluid entry means for admitting a second liquid phase reactant, third fluid entry means for admitting a carrier gas into the elongated middle section, and diffusing means for permitting the carrier gas and the second liquid phase reactant to dynamically contact each other for formation of a gas phase reactant, said diffusing means communicating with the middle section of the cylindrical housing to enable the gas phase reactant to flow into the reaction chamber to react with the first liquid phase reactant to form fibrides;

outlet means spaced above said elongated middle section and forming an extension of said reaction chamber for permitting discharge of said fibrides from said reaction chamber.

5. An apparatus for producing fibrides of synthetic heterochain polymers, comprising:

a cylindrical housing extending in a vertical plane including an upper end portion, an opposite lower tapered end portion, and an elongated middle section intermediate the upper end portion and lower end portions and communicating with said upper and lower end portions;

said upper end portion including a reaction chamber;

first entry means, for admitting liquid phase reactants into the reaction chamber comprising a mechanical slit nozzle, having a first end fluidly connected to an inside wall surface of the reaction chamber, said entry means being oriented along an axis of said reaction chamber and having a second end with a torch opening angle ranging from 110° to 180°;

predetermined dynamic head forming means comprising a substantially horizontal perforated partition with a free cross section of from 18 to 40%, mounted intermediate the lower end portion of the reaction chamber and an upper end portion of the middle section;

said mechanical slit nozzle mounted to an inside wall of said reaction chamber and extending along the axis of said reaction chamber so that the slit of said nozzle is spaced from the surface of said horizontal perforated partition a distance of from 0.1 to 0.04 times the height of the reaction chamber;

said lower tapered end portion including second fluid entry means for admitting a second liquid phase reactant, third fluid entry means for admitting a carrier gas into the elongated middle section, and diffusing means for permitting the carrier gas and the liquid phase reactant to dynamically contact each other for formation of a gas phase reactant, said diffusing means communicating with the middle section of the cylindrical housing to enable the gas phase reactant to flow into the reaction chamber through said perforated partition to react with the first liquid phase reactant to form said fibrides;

outlet means spaced above said elongated middle section and forming an extension of said reaction chamber for permitting discharge of said fibrides from said reaction chamber.

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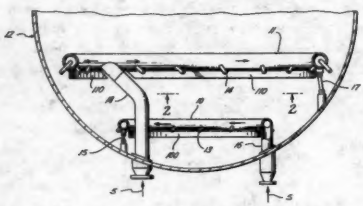
**4,610,851**

## AIR DISTRIBUTOR FOR FCCU CATALYST REGENERATOR

**James H. Colvert, and Thomas A. Lionetti, both of P.O. Box 52332, Houston, Tex. 77052**

**Filed Nov. 28, 1984, Ser. No. 675,499**
**Int. Cl.[4] F27B *15/10***
**U.S. Cl. 422—310** **1 Claim**



1. An improved air distributor apparatus for delivering a high velocity oxygen-carrying gas such as air to a zone of spent catalyst in a regenerator in a fluid catalytic cracking process comprising

a horizontally positioned air ring comprising an underside and containing an air ring bore through which high velocity oxygen-carrying gas is flowed to a plurality of nozzles,

said plurality of nozzles being further defined in that (i) each nozzle contains a nozzle bore of an inside diameter to flow high velocity oxygen-carrying gas at a velocity of about 100 to 200 ft./sec. from the air ring bore to penetrate the zone of spent catalyst,

and (ii) each nozzle is positioned to direct the flow of high velocity oxygen-carrying gas downward thereby producing a vertical component to penetration;

wherein the improvement comprises:

a baffle extending from the air ring vertically downward an effective length to prevent the horizontal flow of oxygen-carrying gas directly under the air ring, thereby preventing the erosion of the underside of the air ring by the flow of spent catalyst carried by high velocity oxygen-carrying gas after penetrating the zone, thereby improving air distribution within the zone of spent catalyst.

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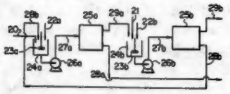
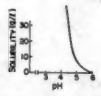
**4,610,852**

## PROCESS FOR STRIPPING URANIUM

**Kiyoshi Fujiwara, and Shoji Yoshinaga, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 448,275, Dec. 9, 1982, abandoned. This application Feb. 28, 1984, Ser. No. 584,447**
**Claims priority, application Japan, Dec. 14, 1981, 58-200182**
**Int. Cl.[4] C01G *43/01*; B01D *11/04***
**U.S. Cl. 423—9** **13 Claims**






1. A process for stripping uranium from an organic solvent containing a uranium-laden, amine-based extracting agent into an aqueous ammonium sulfate solution, which comprises mixing an organic solvent containing a uranium-laden, amine-based extracting agent, an aqueous ammonium sulfate solution and an alkali, to obtain a mixture having a pH of 4.5 to 6.0 and a temperature of 15° to 50° C., and subjecting the resulting mixture to an action of centrifugal force of 850 G or higher, thereby separating the mixture into an organic solvent freed from the uranium and an aqueous ammonium sulfate solution containing the uraniun,

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**4,610,853**

## PROCESS FOR PRODUCING PURIFIED MONOAMMONIUM PHOSPHATE FROM WET PROCESS PHOSPHORIC ACID

**Taizo Kajitani; Shigeo Fujii; Tadao Sato; Ikuo Yonehara; Chikashi Fukumura, and Kenji Harita, all of Kitakyushushi, Japan, assignors to Chisso Corporation, Osaka, Japan**

**Filed Mar. 8, 1985, Ser. No. 709,923**
**Int. Cl.[4] C01B *25/28***
**U.S. Cl. 423—310** **2 Claims**

1. A process for producing purified monoammonium phosphate from wet process phosphoric acid which process comprises

(a) reacting ammonia with wet process phosphoric acid in a reactor while keeping the reaction temperature at 50° to 80° C. and the molar ratio of $NH_3/H_3PO_4$ at 0.9 to 1.35 to form a slurry comprising monoammonium phosphate crystals and an insoluble sludge;

(b) separating the resulting slurry containing monoammonium phosphate crystals and an insoluble sludge into a

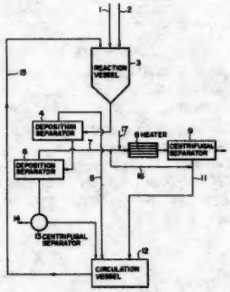
slurry containing a larger portion of said crystals and a slurry containing a larger portion of said insoluble sludge;

(c) subjecting said slurry containing the larger portion of said crystals to centrifugal separation and deposition to thereby recover the crystals, while returning the separated liquid to said reactor;

(d) heating said slurry containing the larger portion of said insoluble sludge to 60° to 95° C. to dissolve monoammonium phosphate contained therein, followed by subjecting the resulting liquid slurry to centrifugal separation to thereby form an insoluble sludge and a filtrate, and returning the separated filtrate to said reactor;

(e) concentrating the liquids returned to said reactor at the steps (c) and (d) to form a slurry containing monoammonium phosphate crystals; and

(f) repeating the steps (b)–(d).

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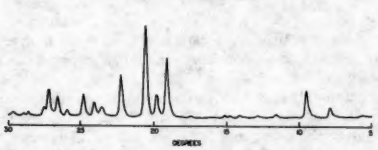
**4,610,854**

## ZEOLITE SSZ-15 AND PROCESS FOR PREPARING THE SAME

**Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Oct. 29, 1982, Ser. No. 437,709**
**Int. Cl.⁴ C01B *33/20***
**U.S. Cl. 423—326** **3 Claims**




1. A zeolite having a composition, as synthesized and in the anhydrous state, in terms of mole ratios of oxides as follows: $(0.5 \text{ to } 1.0)R_2O:(0 \text{ to } 0.50)M_2O:W_2O_3:(\text{greater than } 5)\ YO_2$ wherein M is an alkali metal cation, W is selected from aluminum, gallium and mixtures thereof, Y is selected from silicon, germanium and mixtures thereof, R is an organic nitrogen cation, selected from the group consisting of cyclopentyl trimethylammonium and cyclohexyl trimethylammonium cations, and having the X-ray diffraction lines of Table 1.

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**4,610,855**

## SYNTHESIS OF ZEOLITE ZSM-14

**Ernest W. Valyocsik, Yardley, Pa., and Eric G. Derouane, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 595,226, Mar. 30, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 778,735**
**Int. Cl.⁴ C01B *33/28***
**U.S. Cl. 423—328** **5 Claims**

1. A synthetic crystalline ZSM-14 zeolite material having the formula, in terms of mole ratios of oxides, in the anhydrous state as follows:

$(0.005\text{–}5)R_2O:(0.01\text{–}5)M_{2/n}O:(X)Al_2O_3:100SiO_2$

wherein X is from about 0 to 0.2; R is represented by the formula:

$$R''—O—R'—O^-—A^{m+}_{1/m}$$

wherein A is a cation having a valence m, R' is a sulfonated succinic acid moiety, and R'' is an ethoxylated alkyl group having 8 to 12 carbon atoms in the alkyl chain or an ethoxylated phenol alkyl group having 8 to 12 carbon atoms in the alkyl chain, and M is an alkali metal or an alkaline earth metal having a valence n, and having the X-ray powder diffraction pattern substantially as set forth in Table I of the specification.

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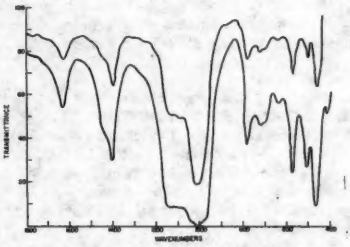
**4,610,856**

## SILICON SUBSTITUTED ZEOLITE COMPOSITIONS AND PROCESS FOR PREPARING SAME

**Gary W. Skeels, Brewster; Donald W. Breck, deceased, late of White Plains, and by Harold Blass, executor, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.**

**Division of Ser. No. 315,853, Oct. 28, 1981, Pat. No. 4,503,023, which is a continuation-in-part of Ser. No. 66,330, Aug. 14, 1979, abandoned. This application Feb. 7, 1985, Ser. No. 699,242**
**Int. Cl.⁴ C01B *33/28***
**U.S. Cl. 423—328** **10 Claims**




1. Crystalline zeolite aluminosilicate having extraneous silicon atoms in its crystal lattice in the form of framework $SiO_4$ tetrahedra, and having in the dehydrated state a chemical composition expressed in terms of mole ratios of oxides

$$0.9\pm0.1M_{2/n}O:Al_2O_3:xSiO_2$$

wherein "M" is a cation having the valence of "n" and wherein said aluminosilicate has a combination of X-ray powder diffraction pattern and a value for "x" selected from the group consisting of:

(i) a value for "x" of greater than 8 and an X-ray powder diffraction pattern having at least the d-spacings set forth in Table G or Table H or Table K or Table I; and

(ii) a value for "x" of greater than 7, and an X-ray powder diffraction pattern having at least the d-spacings set forth in Table D; and

(iii) a value for "x" of greater than 11, and an X-ray powder diffraction pattern having at least the d-spacings set forth in Table J; and

(iv) a value for "x" of greater than 20, and an X-ray powder diffraction pattern having at least the d-spacings set forth in Table L.

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**4,610,857**

## METHOD FOR MAKING ULTRA-FINE CERAMIC PARTICLES

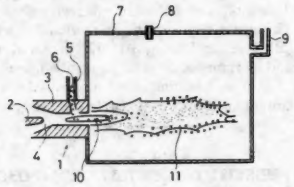
**Masahiro Ogawa, Toyoake, and Susumu Abe, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Feb. 14, 1985, Ser. No. 701,511**

**Claims priority, application Japan, Feb. 22, 1984, 59-31942**

**Int. Cl.[4] C01B *13/20, 21/06, 31/30;* C01G *1/02***

**U.S. Cl. 423—335** **10 Claims**




1. A method for producing ultra-fine ceramic particles which comprises the steps of:

forming a plasma jet in a reaction gas atmosphere containing an element constituting a portion of the intended ultra-fine ceramic particles,

injecting a metal powder constituting a remaining portion of said intended ultra-fine ceramic particles into said plasma jet at a rate of not less than 70 grams per minute to vaporize said metal powder by the heat of said plasma jet and to react the resulting vaporized metal with said element contained in said reaction gas atmosphere for synthesizing said intended ultra-fine ceramic particles, and

gathering the resulting ultra-fine ceramic particles.

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**4,610,858**

## CHLOROSILANE DISPROPORTIONATION CATALYST AND METHOD FOR PRODUCING A SILANE COMPOUND BY MEANS OF THE CATALYST

**Mitsunori Yamada, Omi; Masaji Ishii, Tokyo; Akira Miyai, Machida; Yukihiko Nakajima, Atsugi, and Shinsei Sato, Yamato, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 20, 1985, Ser. No. 713,901**

**Claims priority, application Japan, Apr. 6, 1984, 59-67488; Apr. 6, 1984, 59-67490**

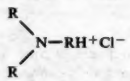
**Int. Cl.[4] C01B *33/04, 33/107***

**U.S. Cl. 423—342** **8 Claims**

1. A method for disproportionating at least one chlorosilane selected from the group consisting of monochlorosilane, dichlorosilane and trichlorosilane, comprising:

conducting said disproportionation in the presence of a chlorosilane disproportionation catalyst comprising (1) a tertiary amine of the formula:

wherein each R group represents an aliphatic hydrocarbon group and the sum of carbon atoms in the three aliphatic hydrocarbon groups is at least 12, and (2) a teritary amine hydrochloride of the formula:



wherein R is as defined above.

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**4,610,859**

## PROCESS FOR PRODUCING SILICON HYDRIDES

**Hiroharu Miyagawa; Masayoshi Itoh, both of Yokohama; Tomohiro Abe, Yokosuka; Kenji Iwata, and Kyogo Koizumi, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Filed Dec. 27, 1984, Ser. No. 686,893**

**Claims priority, application Japan, Dec. 29, 1983, 58-245772; Dec. 29, 1983, 58-245773; Feb. 25, 1984, 59-34830; Jun. 11, 1984, 59-119380**

**Int. Cl.[4] C01B *33/04***

**U.S. Cl. 423—347** **22 Claims**

1. A process for producing silicon hydrides represented by the general formula $Si_nH_{2n+2}$ wherein n is a positive integer of 1 to 6, which comprises reacting a silicon-containing alloy with an aqueous solution of an acid in the presence of at least one inert solvent having a boiling range of from −60° C. to 250° C. selected from the group consisting of an ether, hydrocarbon, a halogenated hydrocarbon, a ketone, an aldehyde, an amine, a silicon hydride and an organosilicon compound.

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**4,610,860**

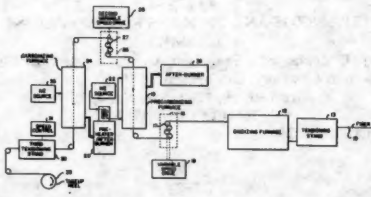
## METHOD AND SYSTEM FOR PRODUCING CARBON FIBERS

**Charles K. Mullen, Anaheim Hills, Calif., assignor to Hitco, Newport Beach, Calif.**

**Continuation of Ser. No. 541,652, Oct. 13, 1983, abandoned. This application Jun. 5, 1985, Ser. No. 742,103**

**Int. Cl.[4] D01F *9/22***

**U.S. Cl. 423—447.8** **27 Claims**



1. The method of producing carbon fibers having high tensile strength from carbon-containing precursor fibers comprising the steps of:

(a) heating the fibers under oxidizing conditions at a temperature ranging from about 220° to about 300° C. while elongating the fibers in a range of 10%–15% relative to their original length to provide stabilized fibers;

(b) heating the stabilized fibers in the range of about 350° to about 620° C. while passing heated inert gas at a temperature of at least about 400° C. across the fibers in an amount of between about 10 and 17 liters of gas per gram of fibers, while concurrently stretching the fibers from about 5% to about 20% in comparison to the length of the stabilized fibers, thereby precarbonizing said fibers; and

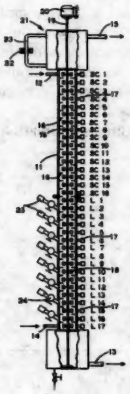
(c) thereafter carbonizing the previously heated stabilized and precarbonized fibers at a temperature in the range of about 800° to about 1250° C., while limiting shrinkage (negative stretch) to the range of about −2.5% to −5.0%.

4,610,861

## PROCESS FOR METAL RECOVERY BY SOLVENT EXTRACTION FROM $CASO_4$ CONTAINING SULFATE SOLUTIONS

Juraj Babjak, Mississauga, Canada, assignor to Inco Limited, Toronto, Canada

Filed Aug. 19, 1985, Ser. No. 767,096
Claims priority, application Canada, Sep. 17, 1984, 463309
Int. Cl.[4] B01D *11/00*; C22B *1/00*
U.S. Cl. 423—157 6 Claims



1. In a process of solvent extracting metal from an aqueous sulfate solution containing calcium in a substantially saturation amount wherein said aqueous solution is contacted in a countercurrent fashion in at least a duality of stages with an organic extractant capable of extracting both said metal and calcium but being substantially selective as to said metal vis-a-vis calcium, the improvement to minimize deposition of gypsum in any one of said stages comprising minimizing contact of said extractant with said aqueous solution when said metal is substantially completely extracted from said aqueous sulfate solution.

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4,610,862

## PROCESS FOR PRODUCING PURIFIED DIAMMONIUM PHOSPHATE FROM WET PROCESS PHOSPHORIC ACID

Taizo Kajitani; Shigeo Fujii; Tadao Sato; Ikuo Yonehara; Chikashi Fukumura, and Kenji Harita, all of Kitakyushushi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 11, 1985, Ser. No. 710,415
Claims priority, application Japan, Mar. 28, 1984, 59-60382
Int. Cl.[4] C01B *25/28*
U.S. Cl. 423—310 2 Claims

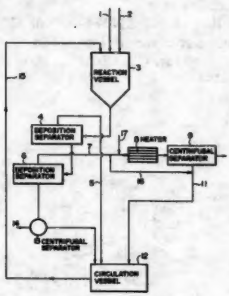
1. A process for producing purified diammonium phosphate from wet process phosphoric acid which process comprises

(a) reacting ammonia with wet process phosphoric acid in a reactor while keeping the reaction temperature at 50° to 80° C. and the molar ratio of $NH_3/H_3PO_4$ at 1.65 to 1.90 to form a slurry comprising diammonium phosphate crystals and an insoluble sludge;

(b) separating the resulting slurry containing diammonium phosphate crystals and an insoluble sludge into a slurry containing a larger portion of said crystals and a slurry containing a larger portion of said insoluble sludge;

(c) subjecting said slurry containing the larger portion of said crystals to centrifugal separation and deposition to thereby recover the crystals, while returning the separated liquid to said reactor;

(d) heating said slurry containing the larger portion of said insoluble sludge to 60° to 95° C. to dissolve diammonium phosphate contained therein, followed by subjecting the resulting liquid slurry to centrifugal separation to thereby form an insoluble sludge and a filtrate, and returning the separated filtrate to said reactor;



(e) concentrating the liquids returned to said reactor at the steps (c) and (d) to form a slurry containing diammonium phosphate crystals; and

(f) repeating the steps (b)–(d).

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4,610,863

## PROCESS FOR FORMING TRANSPARENT AEROGEL INSULATING ARRAYS

Param H. Tewari, Milpitas, and Arlon J. Hunt, Oakland, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 4, 1985, Ser. No. 772,528
Int. Cl.[4] C01B *33/12*
U.S. Cl. 423—338 18 Claims

1. In a drying process for forming transparent aerogel insulating arrays of the type utilizing the steps of hydrolyzing and condensing alkoxides to form alcogels, and subsequently removing the alcohol therefrom to form aerogels, the improvement comprising the additional step, after alcogels are formed, of

substituting a solvent having a critical temperature less than the critical temperature of the alcohol for the alcohol in the alcogels, and drying the resulting gels at a supercritical temperature for the solvent,

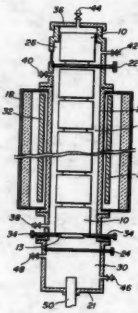
to thereby provide a transparent aerogel array within a substantially reduced drying time period.

4,610,864

## METHOD OF CONTINUOUSLY PRODUCING POWDER OF SILICON COMPOUND USEFUL AS CERAMICS MATERIAL

Tohru Kuramoto; Toshiharu Miki; Kozo Nishino, and Hiroshi Ono, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 2, 1985, Ser. No. 729,740
Claims priority, application Japan, May 9, 1984, 59-91061
Int. Cl.[4] C01B *21/063*
U.S. Cl. 423—344 20 Claims



1. A method of producing a powder of a nonoxide silicon compound useful as a ceramics material, the method comprising the steps of:

putting a granulated or pelleted material comprising silica and carbon into a plurality of containers each of which has ventilating means;

introducing said containers containing said material into an upper section of a substantially vertically extending heating zone in turn, while a nonoxidizing gas atmosphere is maintained in said heating zone at a temperature in the range from 1400° to 2100° C.; and

downwardly moving each of said containers in said heating zone continuously or stepwise such that each of said containers stays in said heating zone for a predetermined period of time.

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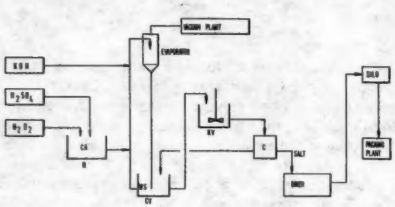
4,610,865

## PROCESS FOR THE PRODUCTION OF POTASSIUM PEROXYMONOSULPHATE TRIPLE SALT

Wolfgang Reh, Planegg, and Siegfried Schelle, Puchheim, both of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Höllriegelskreuth, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,887
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427119
Int. Cl.[4] C01B *15/06, 15/08*
U.S. Cl. 423—513 10 Claims



1. A process for the continuous production of a triple salt designated $2KHSO_5.KHSO_4.K_2SO_4$, from sulphuric acid, hydrogen peroxide and potassium hydroxide, comprising the steps of

concentrating an aqueous working solution which contains $KHSO_5$, sulphuric acid and potassium sulphate in a molar ratio of 1.3 to 2.2/1.4 to 2.0/1, in an evaporation plant under reduced pressure and at a temperature of up to 40° C., to a solution containing 20 to 30% by weight of $KHSO_5$,

removing a partial stream of solution from the remaining concentrated solution,

cooling said partial stream to a temperature below 15° C. to precipitate the triple salt,

separating the triple salt to leave a mother liquor,

combining the mother liquor with the remaining solution,

adjusting the remaining solution to said molar ratio of reactants by adding 90 to 100% sulphuric acid, 30 to 90% hydrogen peroxide and concentrated aqueous potassium hydroxide solution and

recycling the reconstituted solution to the evaporation plant.

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4,610,866

## METHOD FOR PRODUCING BETA-ALUMINAS

Jagadish C. Debsikdar, Columbus, and Beebhas C. Mutsuddy, Lancaster, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 11, 1985, Ser. No. 786,777
Int. Cl.[4] C04B *35/10*
U.S. Cl. 423—600 20 Claims

1. A process for producing crystalline beta-aluminas comprising:

a. preparing a chelated aluminum alkoxide solution;

b. mixing selected reactants with the chelated aluminum alkoxide solution of step a, (1) a first reactant selected from the group consisting of a sodium alkoxide, Na(OR'), wherein each R' is an alkyl group containing from 1 to 3 carbon atoms, a sodium organic salt, R''C—OONa, wherein each R'' is an alkyl group containing from 1 to 2 carbon atoms, and a mixture thereof, (2) a second reactant selected from the group consisting of an alkali metal organic salt, R''C—OOX, an alkaline earth metal organic salt, $(R''C—OO)_2Y$, an alkali metal alkoxide, X(OR'), an alkaline earth metal alkoxide, $Y(OR')_2$, and mixtures thereof, wherein X is the alkali metal and Y is the alkaline earth metal, wherein the selected reactants are those that produce a final product of crystalline beta-aluminas, and polymerizing the mixture by hydrolysis and condensation reactions in a manner adapted to produce a homogeneous beta-alumina precursor gel; and

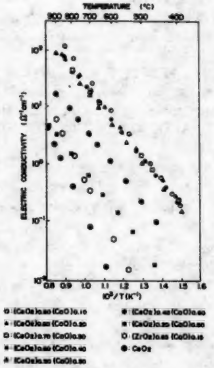
c. heating the beta-alumina gel in a manner adapted to produce crystalline beta-aluminas.

4,610,867

## MATERIAL OF OXYGEN ION CONDUCTOR

Tetsuro Seiyama; Hiromichi Arai, and Toshiya Kunisaki, all of Fukuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,790
Claims priority, application Japan, Oct. 22, 1984, 59-220520
Int. Cl.[4] C01F 11/02, 17/00
U.S. Cl. 423—635 7 Claims




7. Materials of oxygen ion conductors comprising 5–60 mol % of CaO mixed with $CeO_2$ having a fluorite structure, and 1–20 mol % of an oxide of magnesium or aluminum.

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4,610,868

## LIPID MATRIX CARRIERS FOR USE IN DRUG DELIVERY SYSTEMS

Michael W. Fountain, Plainsboro; Steven J. Weiss, Lawrenceville; John J. Kearns, Princeton; Alan L. Weiner, and Mircea C. Popescu, both of Plainsboro, all of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Mar. 20, 1984, Ser. No. 591,576
Int. Cl.[4] A61K 43/00, 49/00
U.S. Cl. 424—1.1 105 Claims

1. Lipid matrix carriers comprising a hydrophobic compound, an amphipathic compound, and a bioactive agent combined in the form of globular structures having a diameter ranging from about 500 nm to about 100,000 nm, the amphipathic compound being present in an amount ranging from about 2% to about 50%, by weight, of the water insoluble components so that the globular structures are stabilized and so that upon administration in vivo the bioactive agent is released at a slow and sustained rate from the globular structures.

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4,610,869

## METHOD FOR IN VIVO TESTING OF BIOLOGICAL RESPONSE MODIFIERS INCLUDING MONOCLONAL ANTIBODIES

Arthur E. Bogden, Westboro, Mass., assignor to EG&G Mason Research Institute, Worchester, Mass.

Filed Oct. 24, 1983, Ser. No. 544,974
Int. Cl.[4] A61K 49/00, 49/02
U.S. Cl. 424—9 20 Claims

1. A method for determining the ability of a biological response modifier to interact with tissue cells comprising:

a. implanting fresh, surgically-obtained tumor tissue under the renal capsule of a host organism;

b. administering said biological response modifier to said host organism; and

c. determining the degree of interaction between said biological response modifier and said tumor tissue.

4,610,870

## CONTROLLED RELEASE FORMULATION

Nemichand B. Jain, Monmouth Junction; Linda P. Gertie, Cinnaminson, and Edward M. Rudnic, Plainsboro, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 5, 1984, Ser. No. 658,005
Int. Cl.[4] A61K 9/22, 9/24
U.S. Cl. 424—19 16 Claims

1. In a controlled release procainamide hydrochloride formulation in the form of a tablet, which is adapted to approach zero order release of procainamide hydrochloride over an 8 to 12 hour or more period, which tablet is comprised of a core containing procainamide hydrochloride and a pharmaceutically acceptable coating therefor, the improvement which comprises incorporating in said core from about 5 to about 15% by weight of one or more hydrocolloid gelling agents having a viscosity of within the range of from about 10,000 to about 200,000 centipoises in 2% solution of 20° C. and are selected from the group consisting of cellulose ethers, cellulose alkyl hydroxylates, cellulose alkyl carboxylates, alkali metal salts of cellulose alkyl carboxylates, gum acacia, guar gum, gum tragacanth, gum xanthan, an alkali metal or alkaline earth metal carageenate, an alginate and mixtures thereof, from 0 to about 8% by weight of one or more non-swellable binders, and from 0 to about 8% by weight of one or more wax-binders and said coating comprises a mixture of at least one hydrophilic polymer and at least one hydrophobic polymer in a weight ratio to each other of within the range of from about 4:1 to about 1:4, and said procainamide hydrochloride is present in said core in an amount of from about 80 to about 95% by weight of the core, which represents an increase in procainamide hydrochloride tablet content of at least about 14% over prior known formulations, the combination of said core and coating providing substantially zero order release of said procainamide hydrochloride.

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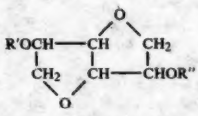
4,610,871

## DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 813,995
Int. Cl.[4] A61K 9/00, 9/68, 7/16
U.S. Cl. 424—48 7 Claims

1. A method for inhibiting the formation of plaque and calculus and relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of throat, mouth, teeth and gums by chewing a taffy, caramel or gum drop composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:




wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of $—CH_3$, $—C_2H_5$, $—C_3H_7$, $—C_4H_9$ or —H when the other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,610,872

## DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

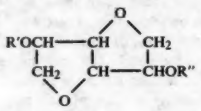
Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649. This application Dec. 27, 1985, Ser. No. 814,000

Int. Cl.[4] A61K *7/16*

U.S. Cl. 424—49 9 Claims

1. In a mouthwash or gargle formulation for inhibiting the formation of plaque and calculus and relieving throat irritation in the oral cavity of mammals which comprises at least two ingredients selected from the group consisting of water, stabilizers, coloring agents, flavoring agents, surfactants, astringents, detergents, medicaments, sweeteners and antibacterial agents, the improvement which consists essentially of including therewith and *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —$CH_3$, —$C_2H_5$, —$C_3H_7$, —$C_4H_9$ or —H when the other R′ or R″ is an alkyl radical of 1–4 carbon atoms.

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4,610,873

## COMPOSITION AND METHOD FOR MAKING A CLEAR AQUEOUS SOLUTION FREE OF CALCIUM PHOSPHATE CRYSTALS

Michael A. Rudy, Rochester, N.Y., and Vincent F. Lisanti, North Bergen, N.J., assignors to Caries Research Group of Rochester, Inc., Rochester, N.Y.

Division of Ser. No. 415,970, Sep. 8, 1982, which is a continuation-in-part of Ser. No. 286,107, Jul. 22, 1981, abandoned. This application Jun. 26, 1984, Ser. No. 624,812

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 22 Claims

1. A method of preparing a clear, stable, aqueous solution comprising:

(1) forming a clear, aqueous solution of a chelating agent for calcium ions;

(2) adjusting said solution of (1) to an alkaline pH;

(3) adding a sufficient source of calcium ions to said solution of (2) wherein at least 50% of said calcium ions are chelated;

(4) adjusting said solution of (3) to an alkaline pH;

(5) adding a source of phosphate ions to said aqueous solution of (4); and

(6) adjusting said solution of (5) to an alkaline pH.

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4,610,874

## HAIR CONDITIONER

Peter Matravers, Los Angeles, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Filed Apr. 12, 1985, Ser. No. 722,964

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 15 Claims

1. A clear wax-free oil-free pourable water soluble base for formulating hair care products consisting in weight percent of: from about 0.1 to about 6 percent ethoxylated cholesterol; from about 0.1 to about 1.0 percent of a polymeric quaternary ammonium salt of hydroxyethyl cellulose reacted with a trimethyl ammonium substituted epoxide; from about 0.5 to about 1.0 percent hydroxyethyl cellulose; and at least 90 percent of a solvent selected from the group consisting of purified water and a water-alcohol mixture.

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4,610,875

## MEDICAMENTS WITH A HIGH DEGREE OF SOLUBILITY AND METHOD FOR THEIR PRODUCTION

Donald E. Panoz, Athlone, and Owen I. Corrigan, Howth, both of Ireland, assignors to Elan Corporation, P.L.C., Athlone, Ireland

Continuation of Ser. No. 422,444, Sep. 23, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,485

Claims priority, application France, Apr. 19, 1982, 82 06646

Int. Cl.[4] A61K *31/79, 9/00, 31/505*

U.S. Cl. 424—80 1 Claim

1. A process for the preparation of a stable pharmaceutical dipyridamole composition with a high dissolution rate in the gastrointestinal tract, in which dipyridamole is in amorphous form, comprising the steps of:

(a) dissolving non-amorphous crystalline dipyridamole in a pharmaceutically acceptable solvent constituted by water, a low molecular weight $C_1$ to $C_4$ alcohol, or mixtures thereof, with a stabilizing and crystal-formation-inhibiting amount of 5% w/w to 35% w/w of polyvinylpyrrolidone with respect to the weight of the dipyridamole;

(b) heating said solution to about 110° to about 150° C.; and

(c) atomizing said heated solution at an input temperature of about 110° to about 150° C. in a sprayer such that the output temperature is between about 80° and about 120° C., to obtain stable amorphous dipyridamole-polyvinylpyrrolidone.

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4,610,876

## ATTRACTANTS FOR FALL CANKERWORM MOTHS

Edward W. Underhill; John W. Wong; Pachagounder Palaniswamy; Warren F. Steck, and Melvin D. Chisholm, all of Saskatoon, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Continuation of Ser. No. 650,191, Sep. 13, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,411

Int. Cl.[4] A01N *27/00;* C07C *11/21*

U.S. Cl. 424—84 12 Claims

1. Essentially pure polyunsaturated straight chain hydrocarbons of nineteen carbon atoms having double bonds in the 3, 6 and 9 positions in the Z-configuaration, and the bond in the 11-position being selected from a double bond in the Z-configuration and a double bond in the E-configuration.

4. An insect attractant dose comprising an essentially pure form of at least 30 μg of at least one of (Z,Z,Z,E)-3,6,9,11-nonadecatetraene and (Z,Z,Z,Z)-3,6,9,11-nonadecatetraene in combination with a selected insect attractant carrier.

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4,610,877

## IMMUNOLOGICAL PREVENTION OF BOAR ODOR IN UNCASTRATED MALE PIGS

Albert M. Pearson, Lansing; Roger I. Brooks, East Lansing; Maynard G. Hogberg, Okemos; James J. Pestka, East Lansing, and J. Ian Gray, Haslett, all of Mich., assignors to Research Corporation, New York, N.Y.

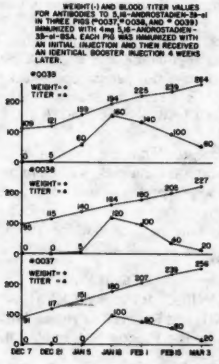
Filed Oct. 19, 1984, Ser. No. 662,662

Int. Cl.[4] A01N *37/18;* A61K *31/56*

U.S. Cl. 424—88 16 Claims

1. An immunogenic composition for the elimination of boar

taint comprising a $C_{19}\Delta^{16}$-steroid conjugate and a carrier protein, wherein the $C_{19}\Delta^{16}$-steroid is 5,16-androstadien-3$\beta$-ol, 4,16-androstadien-3-one and mixtures thereof.


WEIGHT(-) AND BLOOD TITER VALUES FOR ANTIBODIES TO 5,16-ANDROSTADIEN-3β-ol IN THREE PIGS, PO037 (●), PO038, AND (▲) PO039 IMMUNIZED WITH 4mg 5,16-ANDROSTADIEN-3β-ol-BSA. EACH PIG WAS IMMUNIZED WITH AN INITIAL INJECTION AND THEN RECEIVED AN IDENTICAL BOOSTER INJECTION 4 WEEKS LATER.
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JAN 18
FEB 1
FEB 15
MAR 3

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**4,610,878**

**USE OF IN VITRO ASSAY TECHNIQUES TO MEASURE PARAMETERS RELATED TO CLINICAL APPLICATIONS OF TRANSFER FACTOR THERAPY**

**Gregory B. Wilson, Mt. Pleasant, and Herman H. Fudenberg, Isle of Palms, both of S.C., assignors to Medical University of South Carolina, Charleston, S.C.**

**Filed Jun. 16, 1983, Ser. No. 504,986**

**Int. Cl.[4] A61K** *35/14, 39/00;* **C12Q** *1/02*

**U.S. Cl. 424—88** **22 Claims**

1. A method for quantifying parameters related to the clinical use of transfer factor and/or preparations containing transfer factor, said parameters listed in paragraphs, Ia–Ig below, said parameters being selected from the group consisting of:

(Ia) documentation of antigen-selective defects in cell-mediated immunity in patients;

(Ib) selection of potential donors of body fluids, tissues or cells for the making of preparations containing transfer factor;

(Ic) determination of the efficacy of transfer factor in preparations containing transfer factor;

(Id) determination of the responsiveness of the cells of a particular patient to preparations containing transfer factor;

(Ie) prediction of a particular patient's in vivo responsiveness to therapy and/or prophylaxis with preparations containing transfer factor;

(If) determination of dosages of, and administration frequency for, preparations containing transfer factor required for therapy and/or prophylaxis for a particular patient; and

(Ig) the monitoring of a particular patient's responsiveness to treatment with preparations containing transfer factor;

said method comprising obtaining by means of in vitro assay techniques, a measure of mediators of cellular immunity produced and released by leukocytes, said leukocytes set out in paragraphs IIa–IIg below, said leukocytes selected from the group consisting of, for said correspondingly-referenced parameters Ia–Ig:

(IIa) leukocytes of a patient in response to a specific antigen:

(IIb) leukocytes of a potential donor in response to a specific antigen;

(IIc) leukocytes of a subject previously determined not to be responsive to a specific antigen, which leukocytes are newly-sensitized to said specific antigen with a preparation containing transfer factor;

(IId), (IIe), (IIf) leukocytes of a patient newly-sensitized to a specific antigen with a preparation containing transfer factor; and

(IIg) leukocytes of a patient, who has been treated with a preparation containing transfer factor, in response to a specific antigen;

comparing and correlating said obtained measure of produced and released mediators of cellular immunity to a predetermined standard therefor, and determining the quantification of the parameters of Ia–Ig.

21. A methodology for the therapeutic and/or prophylactic use of dialyzable leukocyte extracts containing transfer factor for patients having defects in cell mediated immunity with respect to a specific antigen, comprising the steps of:

(a) documenting antigen-selective defects in cell mediated immunity in a patient by obtaining leukocytes from a patient, maintaining said leukocytes in vitro in the presence of a specific antigen, obtaining a measure, by in vitro assay, of the production and release from said leukocytes of mediators of cellular immunity and utilizing said obtained measure to identify a specific antigen as to which a defect in cell mediated immunity thereto is exhibited by the patient;

(b) selecting potential donors of leukocytes for the preparation of dialyzable leukocyte extract containing transfer factor for use in treatment of the antigen-selective defect identified in (a) by obtaining leukocytes from a donor, maintaining said leukocytes in vitro in the presence of the specific antigen identified in (a), and obtaining a measure, by in vitro assay, of the production and release of mediators of cellular immunity by such leukocytes in response to such antigen, so as to thereby identify a donor exhibiting production and release of mediators of cellular immunity with respect to the antigen;

(c) preparing dialyzable leukocyte extract from the donor;

(d) quantifying the potency of transfer factor in said dialyzable leukocyte extract by identifying a subject who is not responsive to said antigen, obtaining leukocytes from said subject, maintaining said leukocytes in vitro in the presence of said antigen and said dialyzable leukocyte extract, and obtaining a measure, by in vitro assay, of the production and release by such leukocytes of mediators of cellular immunity with respect to the antigen, so as to thereby assign a value to said dialyzable leukocyte extract indicative of its capability of transferring the ability to produce and release mediators of cellular immunity;

(e) preparing a dosage/response correlation between said dialyzable leukocyte extract and leukocytes of the patient by obtaining leukocytes from the patient, maintaining sub-populations of said leukocytes in vitro in the presence of the specific antigen and varying quantities of said dialyzable leukocyte extract, and obtaining a measure for each such quantity of the production and release of mediators of cellular immunity with respect to the specific antigen; and

(f) administering to the patient a quantity of said dialyzable leukocyte extract determined in (e) to be effective in transferring to leukocytes of the patient the ability to produce and release mediators of cellular immunity with respect to the specific antigen.

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**4,610,879**

**FIBRINOLYTIC ENZYME FROM SNAKE VERNOM**

**Francis S. Markland, Jr., Northridge, and Nagendranath K. Reddy, Hacienda Heights, both of Calif., assignors to University of Southern California, Los Angeles, Calif.**

**Filed Jan. 6, 1984, Ser. No. 568,864**

**Int. Cl.[4] A61K** *37/54, 35/58;* **C12N** *9/48, 9/68, 9/64*

**U.S. Cl. 424—94** **3 Claims**

3. A method for the treatment of thromboembolic disease in a patient, comprising administering to such patient a metalloproteinase isolated from the Southern Copperhead snake, A.c. contortrix and having a molecular weight of from about 25–27 kd and an isoelectric point of 6.5 to 7.0, and characterized by

the exhibition of a direct fibrinolytic activity in the essential absence of plasmin activation, said metalloproteinase being administered in the presence of a pharmaceutically acceptable carrier therefor.

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4,610,880

## COMPOSITION FOR CONTROLLING HEMOPHILIA IN MAMMALS

**Alan R. Giles, Kingston, Canada, and Kenneth G. Mann, Rochester, Minn., assignors to Queen's University at Kingston, Kingston, Canada**

**Continuation of Ser. No. 508,213, Jun. 27, 1983, Pat. No. 4,536,392. This application Feb. 6, 1985, Ser. No. 698,840**
**The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.**
**Int. Cl.[4] A61K *35/14***
**U.S. Cl. 424—101** **5 Claims**

1. A pharmaceutical composition for the treatment of hemophillia in mammals comprising a synergistic mixture of phospholipid vesicles and mammal blood Factor Xa in relative proportions just sufficient to induce hemostatasis but insufficient to cause thromposis.

2. A composition as claimed in claim **1** wherein said phospholipid vesicles are a mixture of phosphatidylcholine and phosphatidylserine (PCPS).

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4,610,881

## PROTECTIVE COMPOSITION WITH PENETRATING CARRIER

**Carl C. Bechgaard, Bredballe, DK 7100 Vejle, Denmark**

**Continuation-in-part of Ser. No. 292,994, Aug. 14, 1981, abandoned. This application Feb. 12, 1982, Ser. No. 348,358**
**Int. Cl.[4] A61K *33/22***
**U.S. Cl. 424—148** **7 Claims**

1. A liquid composition for application to a porous substrate liable to harbor infection, consisting essentially of:

(a) as active ingredient, a material containing combined boron in an amount equivalent to more than 25 percent $B_2O_3$ by weight of the material, the quantity of active ingredient being sufficient to provide at least 10 percent by weight of combined boron, calculated as $B_2O_3$, by weight of the composition;

(b) ethylene glycol as liquid carrier for the active ingredient in an amount of at least 50 percent by weight based on the weight of the composition; and optionally

(c) water in an amount of at most 20 percent by weight of the composition.

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4,610,882

## ZEOLITE IN POULTRY FEED UTILIZATION

**Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Jul. 22, 1985, Ser. No. 757,160**
**The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.**
**Int. Cl.[4] A01N *59/06*; A23K *1/24***
**U.S. Cl. 424—154** **20 Claims**

1. A method of improving the feed efficiency utilization of poultry wherein an effective amount of zeolite A sufficient to improve the feed efficiency utilization of the poultry up to about 4 weight percent of the feed is added to the feed of the poultry and the feed is fed to the poultry.

4,610,883

## METHOD OF IMPROVING LIVEABILITY OF POULTRY

**Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Jul. 22, 1985, Ser. No. 757,343**
**The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.**
**Int. Cl.[4] A01N *59/06*; A23K *1/24***
**U.S. Cl. 424—154** **20 Claims**

1. A method of improving the liveability of poultry wherein an effective amount of zeolite A sufficient to decrease the mortality rate of the poultry over that of non-zeolite fed poultry up to about four weight percent of the feed is added to the feed of the poultry and the feed is fed to the poultry.

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4,610,884

## CONFECTIONERY CREMES

**Robert B. Lewis, III, and Robert L. Prosise, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 626,182, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 512,043, Jul. 7, 1983, abandoned. This application Nov. 8, 1985, Ser. No. 795,753**
**Int. Cl.[4] A23G *3/00*; A23D *5/00***
**U.S. Cl. 426—103** **38 Claims**

1. A substantially water-free confectionery creme comprising:

(a) 50% to 80% of a carbohydrate having an average particle size of less than 30 microns;

(b) 20% to 50% of a confectionery fat, said fat comprising coconut oil, said fat having a solid fat content ranging from about 10% to about 55% at 50° F. and from about 3% to about 17% at 70° F., fat having a complete melting point from about 80° F. to about 98° F.;

(c) 0% to about 2% emulsifier; said creme being characterized by:

(a) a back extrusion force of from about 0.3 to about 6 lbs. at 70° F.;

(b) a disordering temperature of less than 102° F.; and

(c) a melt rate of from about 15 seconds to about 75 seconds at 92° F.

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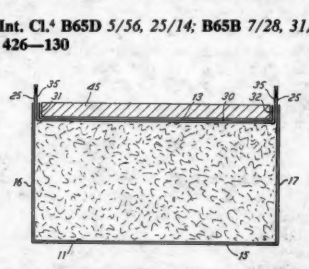
4,610,885

## PACKAGING OF A BLOCK OF CHEESE OR OTHER SOFT PRODUCT

**John A. R. Tait, Keinton Mandeville, England, assignor to Wincanton Engineering Limited, London, England**

**Filed Jun. 27, 1984, Ser. No. 625,562**
**Claims priority, application United Kingdom, Jul. 7, 1983, 8318442**
**Int. Cl.[4] B65D *5/56, 25/14*; B65B *7/28, 31/04***
**U.S. Cl. 426—130** **13 Claims**




1. A package containing a block of natural cheese or other soft product in a sealed container in which the container has internal dimensions similar to the external dimensions of the block and comprises a body which is open at one end thereof and a separate lid of a size to be sliding fit in the open end of the

body, wherein the body and the lid each have an internal lining formed of flexible sheet material which is substantially impervious to air and moisture, the sheet material being secured to the inside surfaces of the body and the lid over at least a substantial proportion of said surfaces, and the sheet material on the body and on the lid extending out of the open end of the body to form two endless collars extending around the periphery of the open end of the body the two collars are sealed together around the full periphery thereof to seal the container such that the position of the seal will permit a small degree of freedom of movement of the lid into the body, and the interior of the sealed container is at a sub-atmospheric pressure so that the external atmospheric pressure forces the lid against the block of cheese and causes the cheese to spread laterally outwards and take the shape of the interior of the container.

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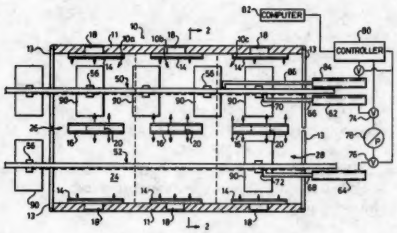
**4,610,886**

## MULTI-CONVEYOR PROCESSING SYSTEM

**Guy E. Buller-Colthurst, Erin, Canada, assignor to Knud Simonsen Industries Limited, Rexdale, Canada**

**Filed Jun. 7, 1984, Ser. No. 618,424**
**Int. Cl.[4] G01N *33/02;* A23B *4/04;* B65G *23/38***
**U.S. Cl. 426—233** **12 Claims**




8. A method of processing first and second meat products under identical process conditions, said first and second meat products being suitable for processing under the same conditions, one of said first and second products being processed at different timings than the other of said first and second products, and comprising:

assembling batches of said first product and batches of said second product on separate batch support means;

introducing a batch of said first product into a processing chamber defining at least two sequential zones, along a first conveyor path passing through said zones;

introducing a batch of said second product into the same said processing chamber along a second conveyor path parallel to and spaced from said first conveyor path, and passing the same through each of said zones of said chamber;

circulating air and tempering the same in a first one of said zones thereby establishing a first processing condition in said first zone;

circulating air and tempering the same in a second one of said zones thereby establishing a second processing condition in said second zone;

moving said batch of said first product in steps through said zones of said chamber and stopping same for processing at predetermined time intervals, whereby to procure first predetermined dwell times of said batch of said first product in each of said zones, and,

moving said batch of second product in steps through each of said zones and stopping same for processing under conditions identical to said batch of said first product at a pre-determined second series of timed intervals whereby to procure second dwell times in each of said zones different from said first dwell times of said batch of said first product.

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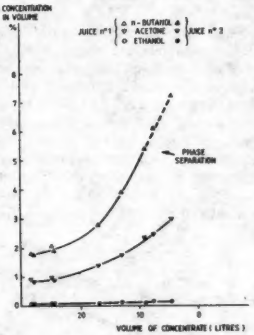
**4,610,887**

## PROCESS FOR CONCENTRATION OF FERMENTED JUICES BY REVERSED OSMOSIS

**Pierre Galzy, Montpellier; Guy Moulin, St Gely Du Fesc; Richard Dick, Paris, and Gérard Mavel, Antony, all of France, assignors to Institut National de Recherche Chimique Appliquee, Antony, France**

**Filed Oct. 16, 1984, Ser. No. 661,444**
**Claims priority, application France, Oct. 17, 1983, 83 16452**
**Int. Cl.[4] C12G *3/10***
**U.S. Cl. 426—490** **4 Claims**




1. A process for treating fermented juices by reverse osmosis to increase the concentration of organic substances, comprising

passing the fermented juices at a pressure greater than 60 bars and under strong turbulency through at least one semi-permeable membrane,

said fermented juices having a high content above 2% of organic substances of molecular weight lower than 200,

said semi-permeable membrane having a retention rate with respect to organic substances of molecular weight lower than 200 expressed as between 80 and 99% for an aqueous ethanol solution of 2–3% under a pressure of between 50 and 60 bars, said semi-permeable membrane further having high strength and chemical resistance with respect to said organic substances of molecular weight lower than 200,

whereby substantially no loss of said organic substances of low molecular weight occurs and a retanate is obtained without denaturation of said organic substances, the analytic and organoleptic characteristics of said organic substances being preserved.

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**4,610,888**

## BEER FOAM ENHANCING PROCESS AND APPARATUS

**James Teng, and John H. Dokos, both of St. Louis, Mo., assignors to Anheuser-Busch Companies, Inc., St. Louis, Mo.**

**Filed May 17, 1985, Ser. No. 735,443**
**Int. Cl.[4] A23L *1/42***
**U.S. Cl. 426—569** **8 Claims**

1. A process for foaming malt beverages comprising the steps of

(a) moving a pressurized malt beverage stream from a container through a passage,

(b) dividing the malt beverage stream into a plurality of smaller streams of higher linear velocity and discharging the smaller streams into a mixing chamber,

(c) injecting a nitrogen containing gas into the mixing chamber,

(d) intimately mixing the nitrogen containing gas into the malt beverage streams, and

(e) discharging the malt beverage mixed with nitrogen containing gas as a thick creamy stable foam.

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4,610,889

## LOW-TRANS FATS AND OIL- AND WATER EMULSION SPREADS CONTAINING SUCH FATS

Werner J. Schmidt, Brake, Fed. Rep. of Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 25, 1985, Ser. No. 695,106

Claims priority, application Netherlands, Jan. 30, 1984, 8400270

Int. Cl.[4] A23D *3/00, 5/00*

U.S. Cl. 426—602 13 Claims

1. A fat blend comprising a mixture of triglycerides wherein lauric acid is present at a level ranging from 5–20 wt%, the sum of the levels of palmitic acid and stearic acid ranges from 18–40 wt%, the level of oleic acid ranges from 19–35 wt%, the level of unsaturated fatty acids in the transconfiguration is less than 15 wt% and the level of linoleic acid ranges from 18–35 wt%, up to 5 wt% of the mixture consisting of triglycerides (i) from 3 saturated fatty acids containing 16 or 18 C-atoms and at least 9 wt% of the mixture consisting of triglycerides (ii) from 2 saturated $C_{16}$- or $C_{18}$-fatty acids and 1 cis unsaturated $C_{16}$- or $C_{18}$-fatty acid, at least 50% of triglycerides (ii) being asymmetrical.

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4,610,890

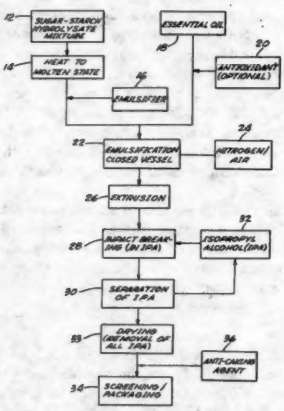
## PREPARATION OF SOLID ESSENTIAL OIL FLAVOR COMPOSITION

Dennis H. Miller, Safety Harbor, Fla., and Jerry R. Mutka, Corona, Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Continuation-in-part of Ser. No. 631,302, Jul. 16, 1984, abandoned. This application Jul. 12, 1985, Ser. No. 754,105

Int. Cl.[4] A23L *1/222*

U.S. Cl. 426—651 12 Claims




1. An improved process for preparing a stable, melt-based, extruded, solid essential oil flavor composition comprising:

(i) forming an aqueous mixture of a sugar, a starch hydrolysate and an emulsifier and heating said mixture to approximately its boiling point but not greater than about 126° C.;

(ii) combining and blending an essential oil flavor with said aqueous mixture by agitating said aqueous mixture and said essential oil flavor in a closed vessel under a pressure of about 7 to 50 psi, to form a homogeneous melt;

(iii) extruding said homogeneous melt into a relatively cool solvent to form a solid extruded material; and

(iv) drying and combining said solid extruded material with an anti-caking agent to produce a stable and relatively non-hygroscopic particulate essential oil composition, containing about 14 to 30%, by weight, of the essential oil flavor in encapsulated form.

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4,610,891

## PROCESS FOR SUGAR-COATING SOLID PREPARATION

Yosuke Miyamoto, Okegawa; Hajime Goto, Warabi; Hiroshi Sato, Omiya; Hiroshi Okano, Niiza, and Masao Iijima, Tokyo, all of Japan, assignors to Zeria Shinyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,201

Int. Cl.[4] A61K *9/28*

U.S. Cl. 427—3 7 Claims

1. A process for sugar coating a solid pharmaceutical preparation comprising coating said preparation with an aquous solution of sucrose containing dissolved therein 0.1 to 10% (w/w) of pullulan or a water-soluable derivative thereof or mixtures there of.

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4,610,892

## METHOD FOR PRODUCING A DIRECTED AEROSOL STREAM

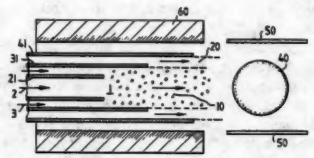
Dietrich Eisbrenner, Ulm, and Hans Merk, Ulm/Gögglingen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,081

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434674

Int. Cl.[4] B05D *1/06*

U.S. Cl. 427—27 5 Claims




1. In a mehtod for producing a directed aerosol stream from gaseous and/or vapor phase reactants by conveying the gaseous and/or vapor phase reactants including vaporous silicon tetrachloride and water vapor to a reaction site in a reaction chamber; reacting the reactants at the reaction site in a flame-free chemical reaction to produce an aerosol composition comprised of solid silicon dioxide particles; and causing the aerosol composition to flow as an aerosol stream from the reaction site and immediately surrounding the aerosol stream with a moving, essentially aerosol-free, gas and/or vapor stream to form a directed aerosol stream enveloped in the aerosol-free stream, the improvement comprising:

including in the gaseous and/or vapor phase reactants to be conveyed to the reaction site at least one vapourous, fluorine-containing hydrocarbon,

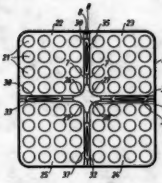
whereby the solid silicon dioxide particles of the aerosol composition comprise silicon dioxide doped with fluorine and the optical index of refraction thereof is reduced.

4,610,893

## METHOD OF MANUFACTURING AN ABSORBER PLATE FOR A BOILING WATER REACTOR

Sven Eriksson, Skultuna; Lars Hälldahl, and Sven-Ake Kohrtz, both of Västerås, all of Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Dec. 19, 1984, Ser. No. 683,463
Claims priority, application Sweden, Dec. 20, 1983, 8307035
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34 11 Claims



1. A method of manufacturing a neutron absorber which can be located in a gap between fuel rod bundles in a boiling water reactor core and which includes a neutron-absorbing material that is enclosed within a protective casing, said method comprising the steps of (1) providing a first elongated supporting sheet which has opposite sides and opposite longitudinal edges, each of said opposite sides having a longitudinal middle portion, (2) spraying a neutron-absorbing material onto at least one of said opposite sides of said first supporting sheet such that said neutron-absorbing material forms a solidified layer anchored on the associated side of said first supporting sheet, said spraying being conducted such that the thickness of each said layer of neutron-absorbing material is at a maximum at the longitudinal middle portion of the associated side of said first supporting sheet and successively decreases towards each opposite longitudinal edge thereof, and (3) applying a protective casing over each layer of solidified neutron-absorbing material on said first supporting sheet so as to encase each said layer.

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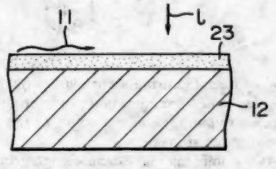
4,610,894

## METHOD OF MANUFACTURING SURFACE ACOUSTIC WAVE DEVICE

Kentaro Setsune, Sakai; Osamu Yamazaki, Toyonaka; Kiyotaka Wasa, and Kazuo Tazuke, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 19, 1984, Ser. No. 623,131
Claims priority, application Japan, Oct. 21, 1983, 58-197833
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 6 Claims




1. A method of manufacturing a surface-acoustic-wave device including a substrate having a surface and interdigital electrodes formed on the surface, said method comprising:

depositing, by evaporation, a thin film of imperfect lattice configuration on the surface of the substrate, the thin film having a thickness not exceeding 0.03λ, wherein λ is the wavelength of the surface acoustic wave; and

applying, after said depositing step, light having a wavelength not exceeding 5000 Å to the surface of the substrate through which a surface acoustic wave is propagated, causing the surface of the substrate to have a more fine structure so as to vary the propagation velocity of the surface acoustic wave and thereby finely adjust the operating frequency of the surface-acoustic-wave device.

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4,610,895

## PROCESS FOR METALLIZING PLASTICS

Timothy S. Tubergen, Northbridge, and Terrell A. Benjamin, Acton, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 575,872, Feb. 1, 1984, Pat. No. 4,592,929.
This application Mar. 14, 1985, Ser. No. 711,499
Int. Cl.[4] C23C *18/24*
U.S. Cl. 427—98 16 Claims

1. A process for the metallization of a plastic by electroless deposition including the step of treating the plastic with a liquid solution of an oxidant selected from the group consisting of hexavalent chromium solutions and permanganate solutions prior to the metallization of the plastic, said process comprising contact of the plastic subsequent to treatment with the oxidant and prior to the steps of catalyzation and metallization with a solution consisting essentially of a surface active agent in a concentration sufficient to reduce the surface tension of said solution to 50 dynes per square centimeter or less at the operating temperature of the solution.

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4,610,896

## METHOD FOR REPAIRING A MULTILAYER COATING ON A CARBON-CARBON COMPOSITE

Richard D. Veltri, East Hartford, and Francis S. Galasso, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 8, 1985, Ser. No. 721,248
Int. Cl.[4] B32B *35/00*
U.S. Cl. 427—140 3 Claims

1. A method of repairing a discontinuous multilayer silicon carbide-silicon nitride coating on a carbon-carbon composite comprising maintaining the coated carbon-carbon composite at about 1200° C. to about 1900° C. and an absolute pressure of less than about 200 millimeters of mercury while passing a gaseous mixture comprising silicon halide or silane and anhydrous ammonia or nitrogen over the coated composite, wherein the multilayer coating comprises a pack derived silicon carbide coating bonded to the carbon-carbon composite having a thickness of from about 0.04 mil to about 30 mils and a chemical vapor deposition applied layer of silicon nitride on the outer surface of the silicon carbide layer having a thickness of from about 3 mils to about 30 mils, whereby the thus repaired multilayer coating is essentially resistant to oxidation at temperatures up to 1750° C.

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4,610,897

## RECOVERY OF FUGITIVE DUST

Robert L. Lipscomb, Westminster, Calif.; Virgil H. Cargle, Houston, Tex., and Domenick Bausano, Fountain Valley, Calif., assignors to Exxon Chemical Patents Inc., Florham Park, N.J.

Filed Feb. 1, 1985, Ser. No. 697,307
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—212 12 Claims

1. A method of encapsulation of fugitive carbonaceous dust comprising first adding at least a water-wetting amount of a wetting agent for the dust and sufficient water to moisten a

quantity of carbonaceous dust to said quantity of carbonaceous dust and thereafter admixing an encapsulating amount of an asphalt emulsion with said moistened quantity of carbonaceous dust and recovering balls of agglomerate encapsulated dust, said asphalt comprising from 2 to 5 wt% of said dust.

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**4,610,898**

## PROCESS FOR BAKE COATING THE SURFACES OF SOLID SUBSTANCES

**Dieter Engel, Kelsterbach; Josef Mondt, Königstein, and Helmut Rinno, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Mar. 19, 1985, Ser. No. 714,043**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410235**

**Int. Cl.[4] B05D** *3/02*

**U.S. Cl. 427—379** **18 Claims**

1. A process for bake coating the surfaces of solid materials by applying an amount of an aqueous dispersion to the surface to be coated, the dispersion containing, as binder, a coarse-grained, crosslinkable dispersion copolymer formed from olefinically unsaturated monomers, containing further constituents belonging to the group comprising pigments, dyestuffs, extenders, water-soluble and/or water-dispersible resins, extraneous crosslinking agents, crosslinking catalysts, thickeners, thixotropic agents, wetting agents, anti-corrosion agents, antifreeze agents, light stabilizers, antioxidants and, expos:ng the resulting moist coating to the atmosphere and/or drying it and subsequently baking, wherein the crosslinkable dispersion copolymer is composed of a mixture of at least 2 components which can contain identical or different monomer units and of which at least one component A, which is coarse-grained, has a relatively low average molecular weight, and at least one component B, which is coarse-grained or fine-grained, has a relatively high average molecular weight, and the drying of the applied amount of dispersion is carried out at a temperature below the minimum film-formation temperature of the dispersion and the dried coating is then baked at a temperature above the glass transition temperature of the copolymer.

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**4,610,899**

## ROSETTE RIBBON AND METHOD FOR MAKING THE SAME

**Calvin E. Miller, 200 N. Water St., Ligonier, Ind. 46767**

**Filed Sep. 30, 1985, Ser. No. 781,947**

**Int. Cl.[4] A44C** *3/00*

**U.S. Cl. 428—4** **14 Claims**

1. The method for making a rosette ribbon head comprising the steps of:

providing a first cover layer;

providing a base layer of compressible binder impregnated thermoplastic fiber material;

superimposing said cover layer on said base layer;

providing a heated resilient pad;

placing said superimposed layers between a female die member having a patterned die cavity therein and said resilient pad;

relatively moving said resilient pad and said die to thereby press said superimposed layers between said resilient pad and said die to deform said layers and force said layers into said die cavity, thereby compressing said entire base layer, bonding said first cover layer to said base layer and forming a ribbon head in the pattern of said die cavity; and

removing said ribbon head from said die cavity.

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**4,610,900**

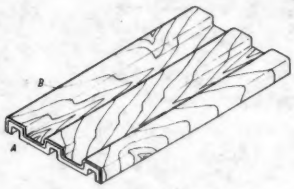
## WOOD-LIKE MOLDED PRODUCT OF SYNTHETIC RESIN

**Sadao Nishibori, 1-9-206, Higashi-shinagawa, 1-chome, Shinagawa-ku, Tokyo, Japan**

**Filed Dec. 19, 1984, Ser. No. 683,641**

**Int. Cl.[4] B32B** *27/04, 3/30*

**U.S. Cl. 428—15** **6 Claims**




1. A wood-like molded product of synthetic resin comprising a molded cross-linked thermoplastic resin product of fine cellulose-base aggregate having only the skin layers on top and bottom surfaces of the molded product removed after molding, by first contracting said molded product in longitudinal direction under heat treatment so as to exude the concentrated resin on the skin layers prior to removing the skin layers, the resultant hardened product being free of warping and shrinking.

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**4,610,901**

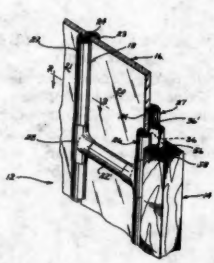
## DUAL GLAZED INSULATABLE STAINED GLASS WINDOW AND METHOD OF MAKING SAME

**John D. Linscott, Everett, Wash., assignor to Wayne Boren Corporation, Houston, Tex.**

**Filed Oct. 25, 1984, Ser. No. 664,800**

**Int. Cl.[4] B44F** *1/06;* **B29C** *39/12;* **B32B** *17/04*

**U.S. Cl. 428—38** **27 Claims**



1. A method of manufacturing a cut glass panel comprising a plurality of glass panes arranged in a predetermined pattern with came flanges spanning adjacent edges of the panes, said method comprising the steps of:

A. forming two complementary came-flange gridworks that correspond as mirror images of the predetermined pattern;

B. forming a pane-gridwork assemblage by positioning the

glass panes upon the inner surface of one of the gridworks, said panes having been shaped and being positioned such that the edges of each pane are separated from the edges of all adjacent panes by spaces that form a network of channels, said channels being completely spanned by the inner surface of said gridwork;

C. filling the channels in the pane-gridwork assemblage with uncured adhesive material;

D. positioning a complementary came-flange gridwork on the opposite side of said pane-gridwork from said first came-flange gridwork, to form a sandwiched assemblage such that at least a portion of the inner surfaces of both gridworks are in substantial contact with said uncured adhesive material in the channels between the panes; and

E. curing the adhesive material.

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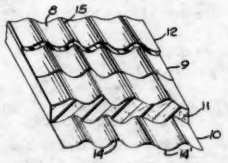
## 4,610,902
## ROOFING MEMBRANES AND SYSTEM

**Robert J. Eastman, Littleton, and Henry S. Goodspeed, Morrison, both of Colo., assignors to Manville Service Corporation, Denver, Colo.**

**Filed Sep. 10, 1985, Ser. No. 774,514**
**Int. Cl.⁴ B32B *3/28*; E04D *1/08***
**U.S. Cl. 428—57** **8 Claims**




1. An embossed laminate suitable for use as a roofing membrane, said corrugated laminate comprising a top and a bottom layer of plastic film bonded together by a modified bitumen material, wherein (i) the modifier for said bitumen is one selected from the group consisting of thermoplastic elastomers, thermoplastic rubbers, and polyurethanes; (ii) the top layer of said corrugated laminate contains or is surface coated with an ultraviolet light resistant and absorbing agent and, (iii) the corrugating of said laminate assists in the elongation and flexibility of said laminate in the lengthwise direction of the laminate to avoid buckling and cracking of said laminate and assists in the stiffness and rigidity of said laminate in the width direction of said laminate to resist wind uplift of said laminate.

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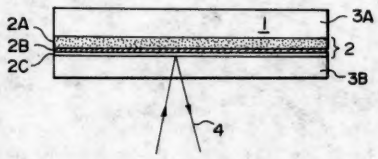
## 4,610,903
## MAGNETO-OPTICAL DISK MEMORY

**Masaaki Nomura; Akira Nahara, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan**

**Filed Dec. 28, 1984, Ser. No. 687,300**
**Claims priority, application Japan, Jan. 6, 1984, 59-650**
**Int. Cl.⁴ G11B *7/24***
**U.S. Cl. 428—64** **4 Claims**




1. A magneto-optical disk memory comprising:

(i) a magneto-optical recording medium comprising a flexible substrate, and a recording thin film overlaid on said substrate, said recording thin film being constituted by an amorphous rare-earth transition metal alloy having the easy axis of magnetization normal to the film surface, and

(ii) two hard supporting disks each contacted closely with the front surface and the back surface of said magneto-optical recording medium wherein the thickness of said substrate is 20 microns or less, and said hard supporting disks are grooved disks and are press-fitted to said magneto-optical recording medium in a vacuum.

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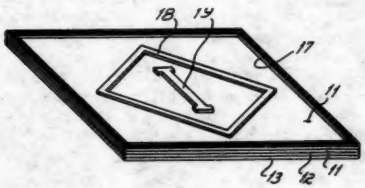
## 4,610,904
## HEAT ACTIVATED REMOVABLE ORNAMENTAL TRANSFER

**John E. Mahn, Sr., 6154 Oak Haven Dr., Cincinnati, Ohio 45238, and John E. Mahn, Jr., Cincinnati, Ohio, assignors to John E. Mahn, Sr., Cincinnati, Ohio**

**Filed Dec. 11, 1984, Ser. No. 680,360**
**Int. Cl.⁴ B44C *1/16***
**U.S. Cl. 428—79** **10 Claims**




1. A decorative transfer comprising:

a lower layer adapted to be thermoplastically adhered to a cloth substrate;

an upper indicia bearing layer overlying and bonded to said lower layer;

said lower layer comprising a high melt, thermoplastic adhesive composition;

said upper layer comprising a thermoset film containing said indicia having a film thickness effective to prevent separation of said thermoplastic layer from said cloth during high temperature laundering and wherein said layers are substantially non-hydrolyzable by an aqueous washing solution having a pH of at least about 10.

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## 4,610,905
## YARN HAVING SPECIFIC PROPERTIES

**Hubert von Blücher, Freytagstrasse 45; Hasso von Blücher, Sohnstrasse 58, both of D-4000 Düsseldorf, and Ernest de Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, all of Fed. Rep. of Germany**

**Filed Nov. 18, 1983, Ser. No. 553,215**
**Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243484**
**Int. Cl.⁴ B32B *5/02, 27/02***
**U.S. Cl. 428—90** **20 Claims**

1. An adsorptive yarn comprising

(a) a yarn constituting a core,

(b) a sheath surrounding the core yarn (a) and comprising a binder having embedded therein activated carbon particles, the sheath thickness ranging from 25 to 300% of the core diameter, the binder being present in from 5 to 200 percent by weight of the carbon particles, and

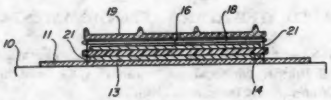
(c) a fiber flock held to the sheath (b) by its binder and imparting to the overall yarn textile-yarn feel, appearance and performance.

4,610,906

## CARPET SEAMING TAPES WITH TWO METAL FOIL LAYERS

Ronald H. Brooks, Chelsea, Australia, assignor to Brooks Electrofoil Seaming Systems Pty. Ltd., Burwood, Australia

PCT No. PCT/AU84/00077, § 371 Date Dec. 26, 1984, § 102(e) Date Dec. 26, 1984, PCT Pub. No. WO84/04646, PCT Pub. Date Nov. 22, 1984
PCT Filed May 7, 1984, Ser. No. 692,884
Claims priority, application Australia, May 6, 1983, PF9204
Int. Cl.[4] H05B *3/16*
U.S. Cl. 428—102 14 Claims




1. Carpet joining tape, comprising, a first strip of metal foil through which an electric current is passed to heat the foil, a second strip of metal foil which overlies the first metal foil strip and is separated therefrom by an electrical insulating material, said strips and insulating material being secured together and each said foil strip acting as an electrical resistive element and having a cross-sectional asrea such that an electrical current passes therethrough generates heat in the foil strip, the combined heat from both foil strips when electricly heated being sufficient to melt a carpet bonding, heat softenable adhesive composition.

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4,610,907

## METAL CORE OF SECTIONS FOR AUTOMOBILE AND SIMILAR VEHICLES

Victorino V. Elvira, Arnedo, Spain, assignor to Elastomeros Riojanos S.A., Arnedo, Spain

Filed Aug. 16, 1983, Ser. No. 523,690
Claims priority, application Spain, May 5, 1983, 522.135
Int. Cl.[4] E06B *7/16*
U.S. Cl. 428—122 4 Claims

1. An improved metal core for sections of automobile and similar vehicles, which besides providing optimum results as regards stiffening effects, is intended to make sure that a weatherstrip is easily ductile in any direction within a plane perpendicular to its own axis and, having a slight shrinking ability, is not capable of being lengthened, comprising:

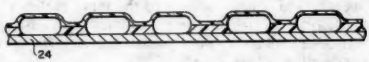
said core being formed from a continuous strip of a metal and proper moulding and ductility, said core having a recticular shape formed by hexagons contracted lengthwise so that the two parallel and neighboring sides of each hexagon are much longer than other pairs of complementary sides, each pair constituting an acute angle, the die-cut strip is folded by two imaginary longitudinal lines touching the larger sides of the hexagons at points next to the side ends whereby said core assumes a U-shaped section.

4,610,908

## INSULATED CONNECTED SHEET MATERIAL

Robert S. Reylek, Shoreview, and James G. Berg, North Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 512,684, Jul. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 334,821, Dec. 28, 1981, abandoned. This application May 6, 1985, Ser. No. 730,256
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—141 29 Claims




1. An electrical connector tape wound upon itself in roll form for convenience in storage and use comprising

an elongated electrically insulating web;

a plurality of narrow parallel elongated electrically conductive stripes supported and held on the insulating web in laterally spaced relation and extending the length of the insulating web;

electrically conductive heat-activated adhesive disposed over said stripes by which the stripes can be conductively bonded to a substrate at all points along the length of the stripes; said adhesive comprising a layer of adhesive material in which are dispersed electrically conductive particles substantially as thick as or thicker than said layer of adhesive material; and

a thin layer covering said electrically conductive adhesive and comprising an electrically insulating material, the exterior surface thereof being contoured, with portions located above electrically conductive areas being higher than surrounding areas, wherein said insulating material is nontacky or poorly tacky at room temperature, softens to an adhesive and flowable condition upon heating to an elevated temperature, and upon cooling at room temperature assumes a firm and substantially nonflowable condition, whereby the connector tape is readily handleable and free from conductive bonding at room temperature but may be laid over a set of adjacent spaced terminal pads with the electrically conductive stripes in registry with the pads and pressed and heated to make bonded electrical connections to the pads.

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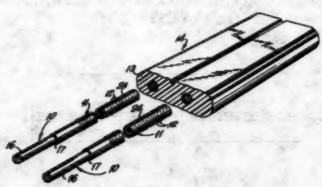
4,610,909

## PLASTIC-COATED METALLIC MEMBER

Albert S. Kiersarsky, Howard County; Earl S. Sauer, Baltimore County; William C. Vesperman, Howard County, and Max K. Wilson, Baltimore, all of Md., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 569,532, Jan. 9, 1984, Pat. No. 4,541,980. This application Feb. 28, 1985, Ser. No. 707,002
Int. Cl.[4] B05D *1/36*
U.S. Cl. 428—202 17 Claims




1. An insulated conductor having at least one smooth, drawn, copper-clad, steel-cored conductor covered with an insulating covering which is applied in a method comprising the steps of supplying indefinite length of conductor, preheating the conductor to a predetermined temperature within a

specific temperature range of applrximately 650° F. to 675° F., generating a cloud of irregularly-shaped, electrostatically-charged particles of unplasticized PVC resin, advancing the preheated conductor through the cloud of electrostatically-charged particles of unplasticized PVC resin, maintaining said conductor at a relative potential with respect to the charged particles of unplasticized PVC resin to cause the particles to deposit on and adhere to the surface of the conductor, and simultaneously, as a result of the heat in the preheated conductor, causing the portions of the particles of unplasticized PVC resin contacting the conductor to melt, to undergo controlled degradation and to adhere to the surface of the conductor, and thus to form relatively stable, texturized, discontinuous coatings of adhesion sites on the conductor while leaving interdispersed portions of the surface of the conductor exposed; and extruding an insulating covering composition containing plasticized PVC resin over the conductor while the temperature thereof is substantially within the speficied temperature range of approximately 650° F. to 675° F., the temperature being sufficient to develop an unexpectedly-superior, relatively-stable, controlled, adhesive bond with the adhesion sites and the interdispersed exposed portions of the surface of the conductor, the magnitude of the adhesive bond being controlled to be consistently within a specified range so that relative movement of the insulating coating axially of the conductor under predetermined stresses is prevented.

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**4,610,910**

## PRINTED CIRCUIT BOARD, PROCESS FOR PREPARING THE SAME AND RESIST INK USED THEREFOR

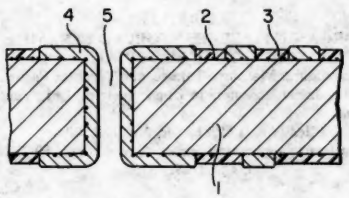
**Mineo Kawamoto, Hitachi; Kanji Murakami, Mito; Haruo Akahoshi, Hitachi; Yoichi Matsuda, Hitachi; Motoyo Wajima, Hitachi; Makoto Matsunaga, Katsuta; Shoji Kawakubo; Toyofusa Yoshimura, both of Ibaraki; Haruo Suzuki, Katsuta, and Tomio Yoshida, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 28, 1984, Ser. No. 655,426**

**Claims priority, application Japan, Sep. 30, 1983, 58-180648**

**Int. Cl.[4] H05K *3/18*; C23C *18/28***

**U.S. Cl. 428—209** **14 Claims**




1. In a printed circuit board comprising an insulation board, the whole surface of the board being provided with a catalyst having reactivity for electroless plating deposition, a resist for electroless plating provided on the insulating board excepting the part where a circuit is to be formed, and a circuit formed by electroless plating, the improvement wherein said resist for electroless plating contains a coupling agent having a function of preventing the catalyst from ionizing by lowering the moisture absorption of said resist.

**4,610,911**

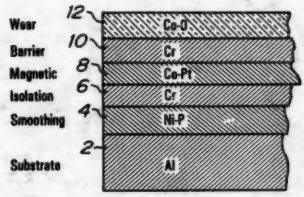
## THIN FILM MAGNETIC RECORDING MEDIA

**James E. Opfer, Palo Alto, and Bangalore R. Natarajan, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Nov. 3, 1983, Ser. No. 549,331**

**Int. Cl.[4] G11B *5/62*; H01F *10/00***

**U.S. Cl. 428—213** **17 Claims**




1. A magnetic film of an alloy of cobalt and platinum formed on a layer of chromium and containing from about 1 to about 20 atomic percent platinum in which the coercivity of said film is determined primarily by the percentage of platinum in said alloy and the saturation magnetization-thickness product of said film is determined primarily by the thickness thereof.

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**4,610,912**

## MAGNETO-OPTIC MEMORY ELEMENT

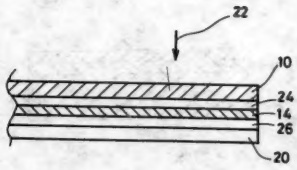
**Akira Takahashi, Nara; Yoshiteru Murakami; Junji Hirokane, both of Tenri; Hiroyuki Katayama, Nara; Kenji Ohta, Yao, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 10, 1984, Ser. No. 648,741**

**Claims priority, application Japan, Sep. 16, 1983, 58-171488; Jul. 3, 1984, 59-139434; Jul. 13, 1984, 59-146234**

**Int. Cl.[4] G11B *7/24***

**U.S. Cl. 428—213** **15 Claims**




1. A magneto-optic memory element comprising:

a transparent substrate;

a first transparent nitride dielectric layer formed on said transparent substrate, said first transparent nitride dielectric layer having a first index of refraction;

an alloy thin-film recording layer including rare earth element and transition metal formed on said first transparent nitride dielectric layer;

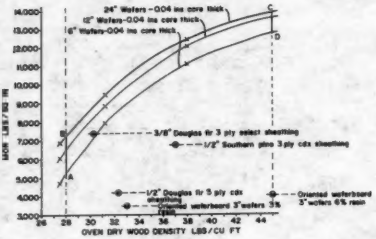
a second transparent nitride dielectric layer formed on said alloy thin-film recording layer, said second transparent nitride dielectric layer having a second index of refraction which is smaller than said first index of refraction; and

a reflection layer formed on said second transparent nitride dielectric layer.

## 4,610,913
## LONG WAFER WAFERBOARD PANELS

Derek Barnes, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Feb. 14, 1986, Ser. No. 829,564
Int. Cl.[4] B32B 5/16, 21/02
U.S. Cl. 428—215 15 Claims


MOR LBS/SQ IN
OVEN DRY WOOD DENSITY LBS/CU FT
24" Wafers - 004 ins core thick
12" Wafers-004 ins core thick
6" Wafers-004 ins core thick
3/8" Douglas fir 3 ply select sheathing
1/2" Southern pine 3 ply cdx sheathing
1/2" Douglas fir 5 ply cdx sheathing
Oriented waferboard 3" wafers 6% resin
Oriented waferboard 3" wafers 3% resin

1. A waferboard panel with increased strength properties comprising at least three layers of wood wafers, having an initial aggregate specific gravity less than about 0.6 oven dry weight with volume at 12% moisture content, the panel having face layers on outside surfaces and at least one core layer, the wafers in the face layers having a mean orientation in the range of about 2° to 10° , the wafers in the face layers having lengths of at least about 6 inches, average widths in the range of about 0.3 to 2.0 inches, and average thickness in the range of about 0.01 to 0.05 inches, the panel having an oven dry wood density in the range of about 28–45 lbs. per cu. ft. with, an MOR to density ratio of at least about 120 and an MOE(M) to density ratio of at least about 40.

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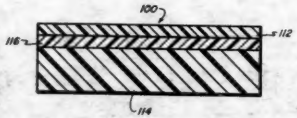
## 4,610,914
## ORIENTED FILMS OF BLENDS OF EVOH COPOLYMER

David L. Newsome, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 290,172, Aug. 5, 1981, abandoned. This application Jul. 19, 1984, Ser. No. 632,675
Int. Cl.[4] B32B 7/02
U.S. Cl. 428—216 29 Claims

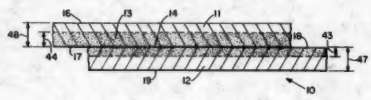



1. An oriented multiple layer polymeric film, comprising:
(a) a first layer, the composition of said first layer being a blend of greater than 40% by weight of an EVOH copolymer and less than 60% of a blend material, the composition of said blend material being chosen from the group consisting of ethylene ethyl acrylate, ethylene acrylic acid, linear low density polyethylene, anhydride modified polypropylene, anhydride modified ethylene vinyl acetate, anhydride modified low density polyethylene, anhydride modified medium density polyethylene, anhydride modified high density polyethylene, partially hydrolyzed ethylene vinyl acetate and blends of said above recited polymers and copolymers, said first layer, in the oriented state, comprising a compatible blend composition; and
(b) a second polymeric layer in face to face contact with said first layer.

## 4,610,915
## TWO-PLY NONWOVEN FABRIC LAMINATE

Susan L. H. Crenshaw, Memphis, Tenn.; Neal L. Schlintz, Gosforth, England, and Danny R. Moore, Germantown, Tenn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 11, 1983, Ser. No. 474,417
Int. Cl.[4] A61F 13/00
U.S. Cl. 428—219 26 Claims




1. A two-ply nonwoven fabric laminate comprising:
(a) a first ply of a synthetic fibrous nonwoven material having an outer surface, an inner surface, and a thickness, and having a basis weight of from about 10 $g/m^2$ to about 50 $g/m^2$;
(b) a second ply of a fibrous nonwoven material having an outer surface, an inner surface and a thickness, and having a basis weight of from about 10 $g/m^2$ to about 50 $g/m^2$; and
(c) a flexible, soft latex binder which adheres said inner surfaces of said first and second plies together, said binder being adhered to substantially all fibers exposed on said inner surfaces of said first and second plies, said binder being present in said first ply from said inner surface of said first ply to a depth of from about 20% to about 80% of said thickness of said first ply, and said binder being present in said second ply from said inner surface of said second ply to a depth of from about 20% to about 80% of said thickness of said second ply.

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## 4,610,916
## MONOFILAMENTS, AND FABRICS THEREOF

Larry Ballard, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed Oct. 31, 1985, Ser. No. 793,580
Int. Cl.[4] D03D 3/00
U.S. Cl. 428—224 29 Claims

1. A monofilament formed by a blend of two resins comprising:
from about 50 to 95 parts by weight of a linear polyphenylene sulfide; and
from about 5 to 50 parts by weight of a melt extrudable copolymer consisting essentially of an olefin and a halogenated monomer.

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## 4,610,917
## INORGANIC FIBER-REINFORCED CERAMIC COMPOSITE MATERIAL

Takemi Yamamura; Masahiro Tokuse, and Teruhisa Furushima, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 1, 1985, Ser. No. 794,300
Claims priority, application Japan, Nov. 6, 1984, 59-232458
Int. Cl.[4] D03D 3/00
U.S. Cl. 428—224 8 Claims

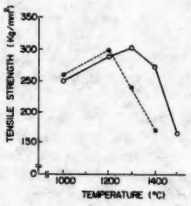
1. An inorganic fiber-reinforced ceramic composite material comprising a matrix of a ceramic and inorganic fibers as a reinforcing material, characterized in that
(a) the inorganic fibers are inorgnic fibers containing silicon, either titanium or zirconium, nitrogen and oxygen and being composed of
(i) an amorphous material consisting substantially of Si, M, N and O, or
(ii) an aggregate consisting substantially of ultrafine crystalline particles with a particle diameter of not more than 500 Å of $Si_2N_2O$, MN, $Si_3N_4$ and/or $MN_{1-x}$, and

amorphous $SiO_2$ and $MO_2$, provided that in the above formulae, M represents titanium or zirconium, and x is a number represented by $0<x<1$, or

(iii) a mixture of the amorphous material

(i) and the aggregate (ii), and

(b) the ceramic is at least one material selected from the group consisting of carbides, nitrides, oxides, glass ceramics, graphite and inorganic materials containing silicon, either titanium or zirconium, nitrogen and oxygen and composed of




(i) an amorphous material consisting substantially of Si, M, N and O, or

(ii) an aggregate consisting substantially of ultrafine crystalline particles with a particle diameter of not more than 500 Å of $Si_2N_2O$, MN, $Si_3N_4$ and/or $MN_{1-x}$ and amorphous $SiO_2$ and $MO_2$, provided that in the above formulae, M represents titanium or zirconium, and x is a number represented by $0<x<1$, or

(iii) a mixture of the amorphous material

(i) and the aggregate (ii).

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**4,610,918**

**NOVEL WEAR RESISTANT FLUOROPOLYMER-CONTAINING FLEXIBLE COMPOSITES**

**John A. Effenberger; Robert C. Ribbans, III, both of Bennington, Vt., and Frank M. Keese, Hoosick Falls, N.Y., assignors to Chemical Fabrics Corporation, Merrimack, N.H.**

**Filed Apr. 13, 1984, Ser. No. 599,765**

**Int. Cl.⁴ B32B *27/00***

**U.S. Cl. 428—245** **8 Claims**

1. A flexible composite which comprises a flexible substrate coated on one or both faces with a matrix comprising:

(a) an initial fluoropolymer-containing layer which includes a fluoroplastic, a curative-free fluoroelastomer or blends or combinations thereof; and

(b) an overcoat layer comprising a blend of (i) a hard polymer and (ii) a fluoropolymer, wherein the fluoropolymer includes a fluoroplastic, a curative-free fluoroelastomer or blends or combinations thereof and wherein said fluoropolymer may comprise from about 40 to 90 percent by weight of the blend of hard polymer and fluoropolymer.

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**4,610,919**

**BINDER FOR FIBROUS PADDING**

**James Kent, La Porte, Ind., assignor to Fiber Bond Corporation, Michigan City, Ind.**

**Filed Jun. 14, 1985, Ser. No. 744,773**

**Int. Cl.⁴ B32B *15/14, 27/04***

**U.S. Cl. 428—285** **13 Claims**

1. In fibrous padding made of thermoplastic fibers and held together by a binder, the improvement comprising, in combination:

said binder comprising a mixture of (a) 25 to 100 parts by weight of an R.F. (radio frequency) sealable dried residue of a latex emulsion of a thermoplastic material primarily selected from the group consisting of polymers made from any of the monomers vinyl chloride, vinylidene chloride, vinyl acetate, ethylene, acrylic and methacrylic esters, and styrene; and (b) 25 to 100 parts by weight of an R.F. sealable thermoplastic powder selected from the group consisting of polyesters and polyamides which melt in a narrower temperature range than said latex emulsion residue.

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**4,610,920**

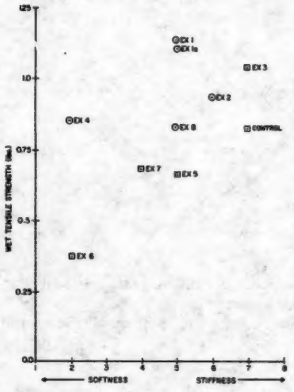
**BINDERS FOR NONWOVENS**

**Paul R. Mudge, Somerville, and Howard G. Katz, Hightstown, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.**

**Filed Jun. 27, 1985, Ser. No. 749,208**

**Int. Cl.⁴ B32B *27/00***

**U.S. Cl. 428—288** **20 Claims**




9. A nonwoven fabric formed from a loosely assembled web of fibers bonded together with an aqueous emulsion; said aqueous emulsion being prepared by the emulsion polymerization of:

(a) 30 to 50% by weight of a vinyl ester of an alkanoic acid;

(b) 10 to 30% by weight ethylene;

(c) 30 to 50% by weight of a $C_4$–$C_8$ alkyl acrylate; and

(d) 1 to 5% by weight of copolymerizable N-methylol containing monomer; wherein the polymerization is performed using batch or semi-batch emulsion polymerization techniques.

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**4,610,921**

**WRAPAROUND CLOSURE**

**Martha G. Follette, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Division of Ser. No. 560,344, Dec. 12, 1983, Pat. No. 4,581,265. This application Aug. 21, 1985, Ser. No. 767,935**

**Int. Cl.⁴ H01B *13/32;* H01R *4/00***

**U.S. Cl. 428—304.4** **6 Claims**

1. An article which comprises:

a surface with a material thereon which material has a cone penetration value of 100 to 350 ($10^{-1}$ mm) and an ultimate

elongation of at least 200% wherein the material is bonded to the surface by a neoprene rubber adhesive.

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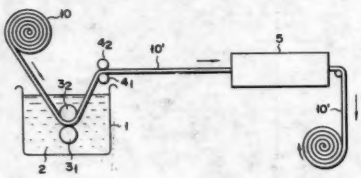
4,610,922

## ASPHALT IMPREGNATED FOAM AND METHOD OF PRODUCING THE SAME

Sadao Kumasaka; Satomi Tada; Koretoshi Katsuki, all of Tokyo; Ryoji Nagamine, Saitama, and Hiroshi Taniguchi, Tokyo, all of Japan, assignors to Human Industry Corporation, Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,523
Claims priority, application Japan, Dec. 27, 1984, 59-278329
Int. Cl.[4] B32B *11/04*
U.S. Cl. 428—304.4 9 Claims




1. An asphalt foam, comprising a foam sheet having open cells and asphalt attached to the cell wall of the foam sheet, said asphalt being mixed with an alkali metal silicate.

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4,610,923

## LAMINATED FABRIC STRUCTURE CONTAINING MICROSPHERES AND PROCESS FOR MAKING SAME

Fredric L. Schrock, Mishawaka, Ind., assignor to Uniroyal Plastics Company, Inc., Middlebury, Conn.

Filed Oct. 16, 1985, Ser. No. 787,878
Int. Cl.[4] B32B *3/26, 7/12*
U.S. Cl. 428—304.4 15 Claims

1. A laminar structure comprising an expandable microspheres-containing elastomeric skin and a stretchable fabric attached thereto.

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4,610,924

## SUPPORT OF PHOTOGRAPHIC PAPER

Shigehisa Tamagawa; Tetsuro Fuchizawa, and Kazuyuki Koike, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 21, 1983, Ser. No. 564,009
Claims priority, application Japan, Dec. 21, 1982, 57-224558
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—331 4 Claims

1. A support of photographic paper comprising a paper sheet coated with a polyolefin resin on both surfaces thereof, in which the surface not to receive a photographic emulsion layer is provided thereon with a writing-retainable layer which comprises crystalline silica having a number-average particle size of 0.1 to 0.3 μm and a film-forming organic polymer having a film strength higher than the pencil hardness H which is selected from the group consisting of gelatin, SBR, MBR and polyurethane, the ratio of the number-average particle size to the thickness of the writing-retainable layer ranging from 1/3 to 3/1, wherein said writing-retainable layer has a thickness ranging from 0.1 to 1 μm.

4,610,925

## ANTISTATIC HAIRBRUSH FILAMENT

William B. Bond, Marietta, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1984, Ser. No. 607,210
Int. Cl.[4] D01F *8/04*
U.S. Cl. 428—368 6 Claims

1. An oriented sheath-core monofilament suitable for use as a hairbrush bristle having a diameter of at least about 0.25 mm and

(A) a core of polymer selected from the group consisting of nylon and polyester in which the polyester is at least about 60 weight percent polybutylene terephthalate and the balance of the polyester is selected from polyethylene terephthalate and cyclohexane dimethanol terephthalate, and

(B) a sheath adhered to the core, comprising about 10–40 weight percent of the monofilament and prepared from polymers selected from the group consisting of nylon 11, nylon 12, nylon 610, nylon 612 and copolyetherester, the sheath polymer having a melting point no greater than that of the core, and the sheath containing about from 20 to 30 weight percent carbon black uniformly admixed with the sheath polymer, the

monofilament having a resistance of less than about 4 megaohms per cm and a Tensile Coefficient of about from 0.3 to 5.0 and provided that when the core of the monofilament is polyester the sheath is copolyetherester, and that when the core is nylon, the sheath is nylon.

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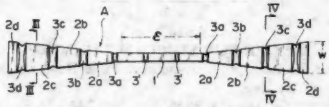
4,610,926

## CONCRETE REINFORCING STEEL FIBERS AND PRODUCTION THEREOF

Yoshitomo Tezuka, Tokyo, Japan, assignor to Tokyo Rope Manufacturing Co., Ltd., Tokyo, Japan

PCT No. PCT/JP83/00115, § 371 Date Dec. 16, 1983, § 102(e) Date Dec. 16, 1983, PCT Pub. No. WO83/03602, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 14, 1983, Ser. No. 573,925
Claims priority, application Japan, Apr. 16, 1982, 57-62502
Int. Cl.[4] B32B *3/02;* D02G *3/00*
U.S. Cl. 428—399 6 Claims




1. A concrete reinforcing steel fiber of wire cut to be mixed into concrete, comprising a central shaft portion having a length of ⅛ to ½ of the full length of the fiber, and two end portions, said two end portions being each formed with a plurality of first knots *2a, 2b, 2c* . . . and a plurality of second knots *3a, 3b, 3c* . . . , wherein said first knots alternate with said second the knots along each end portion, the width W of each second knot gradually increasing in a direction towards a respective end of the fiber and the thickness t of each first knot gradually decreasing in said direction.

4,610,927

## MICROCAPSULES CONTAINING A HYDROPHOBIC, VOLATILE CORE SUBSTANCE AND THEIR PRODUCTION

Yuriko Igarashi, Iwaki, and Masaaki Takahashi, Tokyo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,636
Claims priority, application Japan, Sep. 14, 1983, 58-169789; Sep. 19, 1983, 58-172739
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[4] B01J *13/02*; B32B *27/00*
U.S. Cl. 428—402.21 7 Claims

1. A microcapsule containing a hydrophobic, volatile substance as the core substance, wherein a wall membrane of the microcapsule comprises a polymeric material formed by the interfacial polymerization of a polyvalent isocyanate which is at least one member selected from the group consisting of tolylene diisocyanates, diisocyanate diphenylmethanes, hexamethylene diisocyanates, polymethylene polyphenyl isocyanates, triisocyanatotriphenylmethanes, dimers of tolylene diisocyanates and trimers of tolylene diisocyanates, with a water-soluble cationic urea resin and a prepolymer of an aminoresin, and a polymeric material formed by the polycondensation of the water-soluble cationic urea resin with the prepolymer of an aminoresin in the presence of a low-molecular anionic surfactant.

4. A process for producing a microcapsule containing a hydrophobic, volatile substance as the core substance, comprising dispersing the said hydrophobic, volatile substance containing a polyvalent isocyanate which is at least one member selected from the group consiting of tolylene diisocyanates, diisocyanate diphenylmethanes, hexamethylene diisocyanates, polymethylene polyphenyl isocyanates, triisocyanatotriphenylmethanes, dimers of tolylene diisocyanates and trimers of tolylene diisocyanates in an aqueous medium containing a water-soluble cationic urea resin, a low-molecular anionic surfactant and at least one prepolymer of aminoresin, and maintaining the pH of the resultant dispersion within an acidic range by adding an acid catalyst to interfacially polymerize the polyvalent isocyanate with the water-soluble cationic urea resin and the at least one prepolymer and to precondense the water-soluble cationic urea resin with at least one prepolymer.

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4,610,928

## CURVED HIGH ABSORBANCY WOOD FLAKE

Stanley D. Arasmith, P.O. Box 2458, Rome, Ga. 30164

Division of Ser. No. 423,565, Sep. 27, 1982, Pat. No. 4,503,895.
This application Dec. 17, 1984, Ser. No. 682,699
Int. Cl.[4] B32B *21/02*
U.S. Cl. 428—402 6 Claims

1. A high absorbency, quick-drying wood flake material comprising curved flake members each defining spaced apart top and bottom surfaces, the grain of said wood running between said top and bottom surfaces to define fibers having an average fiber length less than one-fourth inch; said top and bottom surfaces providing exposed end grain surface larger than the side grain surfaces of said flake member by a ratio of at least 2:1.

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4,610,929

## PARTS COATED WITH PRIMER COATING COMPOSITION

Mark F. Mosser, Sellersville, and William J. Fabiny, Harleysville, both of Pa., assignors to Sermatech International, Inc., Limerick, Pa.

Division of Ser. No. 555,457, Nov. 28, 1983, Pat. No. 4,532,289.
This application Apr. 30, 1985, Ser. No. 728,791
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—421 32 Claims

1. A metal part coated with a heat cured primer coating especially suitable for a topcoat of polyvinylidene fluoride, which primer is from an aqueous acidic solution of phosphate ions and ions of the group chromate and molybdate which solution has a pH in the range of about 0 to about 3, and in dispersion therein, particles of polyvinylidene fluoride, said primer coating providing improved bonding and adhesion to the substrate and improved bonding for the polyvinylidene topcoat.

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4,610,930

## MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Toshiyuki Masuda, and Nobuyuki Yamamoto, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 382,746, May 27, 1982, abandoned.
This application Mar. 21, 1985, Ser. No. 714,068
Claims priority, application Japan, Jun. 30, 1981, 56-100421
Int. Cl.[4] B32B *27/38*
U.S. Cl. 428—694 7 Claims

1. A magnetic recording medium having a thin magnetic recording metal film formed on one surface of a non-magnetic base, a thin cured epoxy resin film comprising an epoxy resin and a curing agent being formed on either the thin magnetic metal film or the surface of the non-magnetic base opposite the thin magnetic metal film or both, said epoxy resin having an epoxy equivalent of from 400 to 3,000 and said curing agent being an aliphatic amine having two or more amino groups and three or more amino active hydrogen atoms in the molecular chain wherein the curing agent is contained in the epoxy resin in the amount that satisfies the following relation:

$$0.5 \times \frac{100 \cdot a}{x \cdot E} \leqq y \leqq 1.5 \times \frac{100 \cdot a}{x \cdot E}$$

wherein

y: the amount of the curing agent amine (g) per 100 g of the epoxy resin;

a: the molecular weight of the curing agent amine;

x: the number of amino active hydrogen atoms in the curing agent amine;

E: the epoxy equivalent of the epoxy resin.

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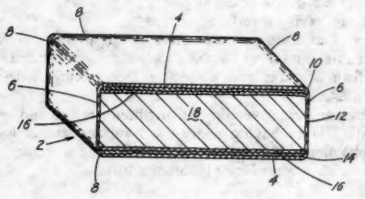
4,610,931

## PREFERENTIALLY BINDER ENRICHED CEMENTED CARBIDE BODIES AND METHOD OF MANUFACTURE

Bela J. Nemeth, and George P. Grab, both of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 248,465, Mar. 27, 1981, abandoned.
This application Mar. 8, 1984, Ser. No. 587,584
Int. Cl.[4] B22F *3/16, 7/02*
U.S. Cl. 428—547 35 Claims

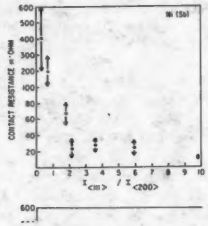



1. A cemented carbide body formed by sintering a substantially homogeneous mixture of constituents comprising: at least 70 weight percent tungsten carbide; a metallic binder; a metal carbide selected from the group consisting of the Group IVB and VB transition metal carbides; said metal carbide being present in an amount less than the amount of tungsten carbide; said body having substantially A to B type porosity throughout said body; said metal carbide combined with said tungsten carbide forming a solid solution carbide; a layer of at least partially solid solution carbide depleted material near a peripheral surface of said body.

## 4,610,932
## ELECTRICAL CONTACTS

Richard Haynes, East Windsor; Hung C. Ling, West Windsor Township, Mercer County, and Sau-Lan L. Ng, Lawrence Township, Mercer County, all of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 6, 1984, Ser. No. 678,892
Int. Cl.[4] G22F *1/10*
U.S. Cl. 428—611 6 Claims

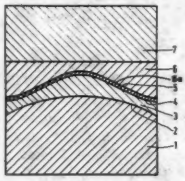



1. An electrical contact comprising a base metal and a nickel layer thereover said nickel layer having an exposed surface which is preferentially oriented in the 111 crystallographic plane and wherein said nickel includes an additive selected from the group consisting of Sb, In, P and Zn in an amount so as to have caused the preferential orientation in the 111 plane.

## 4,610,933
## DUPLICATION MASTER SUITABLE FOR THE MANUFACTURE OF ELECTROPLATED COPIES

Renaat E. Van de Leest, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,758
Claims priority, application Netherlands, Mar. 2, 1984, 8400675
Int. Cl.[4] C03B *11/00*
U.S. Cl. 428—627 4 Claims




1. A duplication master for manufacturing negative copies by electroplating a metal onto a duplication surface of the master, said master consisting essentially of:

a preform having a surface;

a layer of electroplated aluminum on the preform surface, said aluminum layer having a shaped surface opposite the preform surface, said shaped surface having a desired profile; and

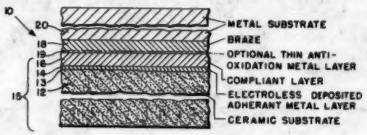
an outer coating layer on the aluminum layer, said outer coating layer having an exposed surface which is the duplication surface of the master, said outer coating layer consisting essentially of titanium nitride.

## 4,610,934
## SILICON CARBIDE-TO-METAL JOINT AND METHOD OF MAKING SAME

Wolfgang D. G. Boecker, Lewiston, and Laurence N. Hailey, Niagara Falls, both of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jan. 17, 1985, Ser. No. 692,944
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—627 9 Claims

1. A silicon carbide article which may be easily brazed to a metal article, the silicon carbide article comprising a silicon carbide substrate having a thin highly adherent layer of metal

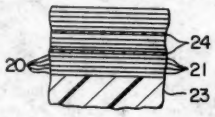



selected from the group consisting of Ni, Cr, Au, Ag or Cu applied to a surface thereof.

## 4,610,935
## MAGNETIC FILM STRUCTURE

Noriyuki Kumasaka, Ome; Hideo Fujiwara, Tokorozawa; Noritoshi Saito, Hachioji; Shigekazu Otomo, Sayama; Takeo Yamashita, Hachioji, and Mitsuhiro Kudo, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,099
Claims priority, application Japan, Jan. 17, 1983, 58-4270
Int. Cl.[4] B32B *15/00, 15/04;* G11B *5/62, 5/127*
U.S. Cl. 428—632 24 Claims




8. A magnetic film structure for a magnetic head comprising:

a first magnetic film having a thickness which ranges from 0.05 μm to 0.5 μm, said first magnetic film being made of a metallic magnetic alloy having a saturation magnetic induction of 10,000 gauss or more and a magnetostriction of $10^{-6}$ or less; and

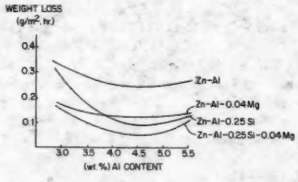
a second magnetic film having a thickness which ranges from 30 Å to 500 Å, said second magnetic film being made of a nickel-iron alloy or an amorphous magnetic alloy different from said metallic magnetic alloy constituting said first magnetic film

said first and second magnetic films being laminated to provide a film structure having a plurality of said first magnetic films and a plurality of said second magnetic films.

## 4,610,936
## HOT-DIP ZINC ALLOY COATED STEEL PRODUCTS

Takehiro Isobe, Bandai, and Tatsuji Hashimoto, Aizuwakamatsu, both of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,509
Claims priority, application Japan, Dec. 12, 1983, 58-234034
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—659 3 Claims




1. A zinc alloy coated steel product coated with a Zn-Al-Si-Mg alloy having a composition consisting of between 3.5 and

5.0 wt% aluminum, between 0.02 and 0.5 wt% silicon, between 0.01 and less than 0.05 wt% magnesium and remainder zinc and unavoidable impurities, said product being capable of withstanding, after exposure to saturated steam for three days at 98° C., a 2T bending test without cracking and a tape test without peeling.

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**4,610,937**

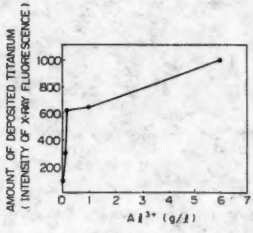
## PRODUCT OF AND PROCESS FOR PREPARING ZN-NI-ALLOY-ELECTROPLATED STEEL SHEETS EXCELLENT IN CORROSION RESISTANCE

**Takehiko Ito, Tokyo; Taisuke Irie; Yoshitaka Nakagawa, both of Osaka, and Koichi Watanabe, Hyogo, all of Japan, assignors to Nisshin Steel Company, Tokyo, Japan**

**Filed Nov. 28, 1983, Ser. No. 555,711**

**Int. Cl.[4] C25D** *3/56, 5/26, 5/50*

**U.S. Cl. 428—659** **15 Claims**




1. A process for preparing zinc-alloy-electroplated steel sheets excellent in corrosion resistance comprising electroplating steel sheets with an aqueous acidic plating bath containing 10–40 g/l (gram as atom per liter bath) zinc, 15–160 g/l nickel, 0.2–10 g/l titanium, 0.1–5 g/l cobalt and 0.1–5 g/l aluminum or 0.2–4 g/l magnesium, the pH of which is 1.5–2.5.

7. The process as recited in any one of claims 1 through 5, wherein the electroplated layer is heated in an atmosphere of 60°–200° C.

12. A product according to the process of claim 1.

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**4,610,938**

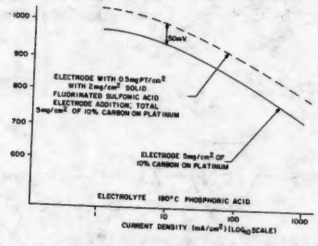
## ACID FUEL CELL

**Anthony J. Appleby, Mountain View, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.**

**Filed Jul. 24, 1985, Ser. No. 759,064**

**Int. Cl.[4] H01M** *4/86, 8/08*

**U.S. Cl. 429—42** **8 Claims**




1. In an electrochemical fuel cell comprising at least one electrode with a catalytic surface for a gas phase reaction, and an acid electrolyte, the improvement comprising a layer bounded to said catalytic surface comprising a fluorinated acid-containing polymer of the following formula:

$$R_1—CF=CF—R''—X$$

wherein X is $—SO_3H$, $—PO_3H_2$,

$$—PO_2H, \quad —\underset{\displaystyle R}{\underset{|}{B}}OH, \quad —\underset{\displaystyle OR}{\underset{|}{B}}OH,$$

$—Si(OR)_2OH$ or $—CO_2H$ wherein R and $R_1$ are independently F or perfluoroalkyl of 1 to 10 carbon atoms, and R'' is $(CFR_2)_n$, wherein n is an integer from 0 to 10, preferably 0 to 5, and $R_2$ is F or perfluoroalkyl of 1 to 3 carbon atoms.

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**4,610,939**

## METHOD AND APPARATUS FOR THE TRANSFER OF AN ELECTROSTATICALLY DEPOSITED TONER IMAGE

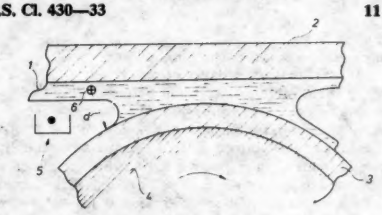
**Jozef L. Mampaey, and Herman J. Remmerie, both of Kontich, Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium**

**Filed Jan. 9, 1985, Ser. No. 689,988**

**Claims priority, application European Pat. Off., Jan. 16, 1984, 84200049.9**

**Int. Cl.[4] G03G** *13/10*

**U.S. Cl. 430—33** **11 Claims**




1. A method of progressively transferring a liquid toner image, formed by developing an electrostatic latent image by means of an electrophoretic developer liquid, from the surface of a first element to the surface of a second element, wherein said surfaces are progressively moved in spaced relationship through an image transfer zone with the liquid toner image sandwiched therebetween and across which there is maintained an electric field which causes the transfer of toner particles to occur within a meniscus of their carrier liquid between the elements, characterized in that before each incremental area of the lump reaches said meniscus, the developer liquid in that area is subjected to electrostatic charging conditions which confer on the carrier liquid thereof in that area a charge of a polarity opposite to the charge of the toner particles.

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**4,610,940**

## METHOD FOR FABRICATING A PHOTOMASK PATTERN

**Satoshi Arakara, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 9, 1984, Ser. No. 658,626**

**Claims priority, application Japan, Oct. 17, 1983, 58-194580**

**Int. Cl.[4] G03F** *9/00*

**U.S. Cl. 430—5** **12 Claims**

1. A method for fabricating a photomask pattern in a layer to be patterned on a photomask plate, said photomask pattern having a plurality of unit patterns arranged in a matrix on an area of said photomask plate, each said unit pattern including vernier patterns arranged in said unit pattern so that overlap of said vernier patterns of adjoining ones of said unit patterns in said matrix occurs, comprising the steps of:

forming said layer to be patterned on the photomask plate;

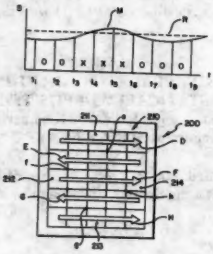
forming a layer of resist on said layer to be patterned;

exposing said layer of resist individually to an optical image of said unit pattern at a plurality of first positions of said

matrix, in a respective succession of times, said plurality of positions being spaced relatively apart from each other within said matrix, as a first exposing mode;

exposing said layer of resist to said optical image in a step-and-repeat movement at the remaining positions of said matrix, including changing the rows one by one after finishing said exposure in said step-and-repeat along each said row, until said unit pattern is exposed at all the positions of said matrix, as a second exposing mode;

developing said layer of resist;



forming said photomask pattern in said layer to be patterned by using said developed layer of resist;

inspecting the positions of said unit patterns of said second exposing mode of the formed photomask pattern over said area by observing the respective amounts of said overlap of the respective vernier patterns exposed by said first exposing mode with respective ones of those exposed by said second exposing mode, so as to enable measurement of accumulated printed shear produced in said second exposing mode over said area of said photomask pattern.

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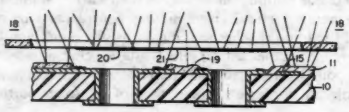
**4,610,941**

## METHOD FOR PHOTOGRAPHICALLY IMPROVING THE RESOLUTION OF SCREEN PRINTED PHOTOPOLYMER IMAGES

**Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406**

**Filed Mar. 19, 1985, Ser. No. 713,550**
**Int. Cl.[4] G03C *5/00***
**U.S. Cl. 430—6** **18 Claims**



1. The process of improving resolution of printed photopolymer patterns of low resolution because of smears at the pattern edges, comprising the steps of:

printing on a substrate surface a pattern of photopolymer with an oxygen inhibited characteristic that leaves the surface in liquid form to a predetermined depth when photoexposed in the presence of air with a predetermined amount of radiation energy, wherein the printing leaves a low resolution pattern with smears of substantially reduced thickness from that of the polymer thickness of the pattern appearing at edge portions of the pattern,

photoexposing the polymer pattern with the surface in contact with air to radiation of such energy that the smears are left in liquid form while polymerizing at least a substantial thickness of the polymer defining the pattern to adhere to the substrate and resist solvency to a predetermined solvent that will remove the liquid form smears of the polymer, and

removing the liquid form smears with said solvent in a development step thereby to increase the resolution of the remaining polymerized pattern.

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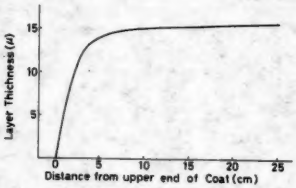
**4,610,942**

## ELECTROPHOTOGRAPHIC MEMBER HAVING CORRESPONDING THIN END PORTIONS OF CHARGE GENERATION AND CHARGE TRANSPORT LAYERS

**Yuichi Yashiki, Yokohama, and Takashi Tanaka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 12, 1985, Ser. No. 700,969**
**Claims priority, application Japan, Feb. 16, 1984, 59-26044**
**Int. Cl.[4] G03G *15/02, 5/00***
**U.S. Cl. 430—58** **14 Claims**




1. An electrophotographic photosensitive member having a cylindrical conductive substrate and a photosensitive laminate of a charge generation layer and a charge transport layer wherein the charge transport layer has a portion having a layer thickness distribution which is continuously reduced toward an end of the member and wherein the charge generation layer has a layer thickness distribution corresponding to the layer thickness distribution of said charge transport layer.

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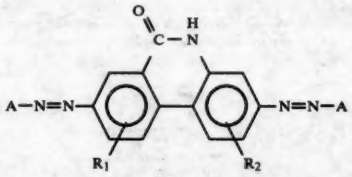
**4,610,943**

## ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER CONTAINS DISAZO PHOTOCONDUCTIVE COMPOUND

**Takao Takiguchi, Tokyo; Hajime Miyazaki, Yokohama; Masakazu Matsumoto, Yokohama, and Shozo Ishikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 19, 1985, Ser. No. 810,743**
**Claims priority, application Japan, Dec. 26, 1984, 59-272795**
**Int. Cl.[4] G03G *5/06***
**U.S. Cl. 430—76** **6 Claims**

1. An electrophotographic photosensitive member, which comprises a photosensitive layer containing a disazo pigment represented by the formula shown below in a photosensitive layer:




(1)

wherein $R_1$ and $R_2$, which may be either identical or different, each represent hydrogen atom, alkyl group, alkoxy group, halogen atom or cyano group, and A represents a coupler residue having a phenolic hydroxyl group.

4,610,944

## PRODUCTION OF TONER

Toru Matsumoto, Tokyo; Masuo Yamazaki, and Katsutoshi Wakamiya, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,498

Claims priority, application Japan, Jan. 12, 1983, 58-3031; Jan. 12, 1983, 58-3032

Int. Cl.[4] G03G 9/00

U.S. Cl. 430—135 38 Claims

1. A process for producing a toner and having a controlled and more uniform particle size distribution, comprising the steps of:

melting a mixture of a long-chain binder compound having a melting point above room temperature, and a colorant;

adding the molten mixture to a heated aqueous dispersing medium in the presence of a substantially water-insoluble fine powdery inorganic dispersant;

stirring the added molten mixture and said aqueous dispersing medium to form suspended particles of said molten mixture dispersed in the aqueous dispersing medium;

cooling the dispersed particles of said mixture;

recovering the cooled particles.

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4,610,945

## ENCAPSULATED TONER HAVING IMPROVED IMAGE-FORMING CHARACTERISTICS

Katsumi Matsuoka, and Takeshi Mikami, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

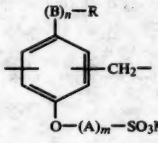
Filed Dec. 14, 1984, Ser. No. 681,860

Claims priority, application Japan, Dec. 15, 1983, 58-236766

Int. Cl.[4] G03G 9/08; G03C 1/08, 1/10

U.S. Cl. 430—138 8 Claims

1. An encapsulated toner comprising a shell and a core material comprising a colorant, a binder and 0.1 to 2% by weight of a surface active polymer containing at least 5 mol % of a unit having the formula (I):




(I)

wherein R is an aliphatic hydrocarbon group having from 4 to 22 carbon atoms, A is a divalent aliphatic group having from 1 to 50 carbon atoms, B is —O— or —NH—, M is a cation or a cationic radical capable of forming a salt with a sulfonic acid, and m and n are independently 0 or 1.

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4,610,946

## ALUMINUM-ZIRCONIUM ALLOY SUPPORT FOR LITHOGRAPHIC PRINTING PLATE

Akira Shirai; Kazushige Takizawa; Yasuhisa Nishikawa, and Tadayuki Katoh, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd. and Nippon Light Metal Co., Ltd., both of, Japan

Filed Feb. 22, 1984, Ser. No. 582,501

Claims priority, application Japan, Feb. 22, 1983, 58-26938

Int. Cl.[4] G03C 1/76

U.S. Cl. 430—278 6 Claims

1. A photosensitive lithographic printing plate comprising a support of an aluminum alloy plate and a photosensitive layer thereon, the aluminum alloy plate comprising an aluminum alloy containing 0.02 to 0.20% by weight zirconium and causing no recrystallization phenomenon at temperatures below 320° C.

4,610,947

## METHOD AND MANUFACTURING POLYIMIDAZOLE AND POLYIMIDAZOPYRROLONE RELIEF STRUCTURES

Hellmut Ahne, Röttenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,447

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411714

Int. Cl.[4] G03C 1/70, 5/16

U.S. Cl. 430—296 9 Claims

1. A method for manufacturing a highly heat-resistant polyimidazole or polyimidazopyrrolone relief structure comprising the steps of: applying a radiation-sensitive soluble polymer precursor as a layer or foil to a substrate; irradiating the applied layer or foil through negative patterns using actinic light or electrons or by guiding a light, electron, ion, or laser beam; removing the unirradiated applied layer or foil parts and annealing the remaining irradiated applied layer or foil parts to produce the polyimidazole or polyimidazopyrrolone relief structure; wherein the polymer precursor is a reaction product, prepared by condensation or addition, as appropriate of:

(a) an aromatic and/or heterocyclic tetraamino compound and one acid selected from group A consisting of an olefinically unsaturated monocarboxylic acid and a dicarboxylic acid in the presence of a carbodiimide to produce an intermediate A followed by condensation of intermediate A and the other acid of group A not already selected, in the presence of a carbodiimide to produce the polymer precursor; or

(b) an aromatic and/or heterocyclic tetraamino compound and one member selected from group B consisting of an olefinically unsaturated monocarboxylic acid and an aromatic and/or heterocyclic tetracarboxylic acid dianhydride, in the presence of a carbodiimide if the monocarboxylic acid is selected, to produce an intermediate B followed by condensation or addition, as appropriate, of intermediate B and the other member of group B not already selected, in the presence of a carbodiimide if the monocarboxylic acid is selected, to produce the polymer precursor; or

(c) an aromatic and/or heterocyclic tetraamino compound and an olefinically unsaturated tetracarboxylic acid diester which is an addition product of a tetracarboxylic acid dianhydride and an olefinically unsaturated alcohol, in the presence of a carbodiimide to produce the polymer precursor.

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4,610,948

## ELECTRON BEAM PERIPHERAL PATTERNING OF INTEGRATED CIRCUITS

William B. Glendinning, Red Bank, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

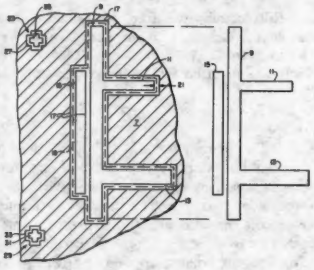
Filed Jan. 25, 1984, Ser. No. 573,546

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—296 5 Claims

1. A method of fabricating a pattern of conductors on a silicon wafer which has been previously patterned with circuit elements, comprising the steps of; applying a thin film of conductive metal to said wafer, applying a positive electron resist over said thin film, then exposing the peripheries of all of the conductors to be patterned on said wafer by means of direct-writing electron beam lithography, developing said lithographed wafer to remove said positive electron resist over said exposed peripheries, then etching said peripheries by removing the conductive material thereon, then removing all of the remaiing positive electron resist from said wafer and coating said entire wafer with a positive photo replication resist, then utilizing proximity photo printing utilizing a photomask with opaque areas slightly larger than the said conductors to be patterned on said wafer, then exposing all of said positive replication resist outside of said opaque areas to ultraviolet flux

which has passed through said photomask, then developing said replication resist and removing said replication resist from



all areas exposed to said ultraviolet flux and then etching away the conductive thin film underlying the said areas exposed to said ultraviolet flux.

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**4,610,949**

## METHOD FOR DIRECT PLATE MAKING FROM MULTICOLOR ORIGINAL

**Eiji Kanada; Kazunaka Endo; Kyonosuke Yamamoto, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Filed Feb. 1, 1985, Ser. No. 697,569**

**Claims priority, application Japan, Feb. 7, 1984, 59-21221**

**Int. Cl.[4] G03F *7/00*; G03C *5/00***

**U.S. Cl. 430—301** **8 Claims**

1. A method for the direct manufacture of printing plates for multicolor lithography, which includes the following steps:

(1) shielding an exposure section against light by a light shielding means;

(2) feeding to said exposure section a magazine containing a sensitive material convertible into lithographic printing plate, which material bears a panchromatically sensitized photographic layer;

(3) bringing said sensitive material into close contact with a contact screen;

(4) exposing said sensitive material to the reflected light from a continuous gradation multicolor original whereby a yellow plate, a magenta plate and a cyan plate is prepared by carrying out the above steps (1), (2), (3), and (4), there being used a color separation filter for at least blue, green and red at the exposing step and a black plate prepared by carrying out the above steps (1), (2), (3), and (4);

(5) exposing at least one of said yellow plate, magenta plate, cyan plate, and black plate to the reflected light from a line drawing original without using a contact screen; and

(6) sending the thus exposed plate to a processing bath section.

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**4,610,950**

## METHOD OF PRODUCING PRINTING PLATES

**Robert D. Milliken, Tokyo, Japan, assignor to W. R. Grace KK, Tokyo, Japan**

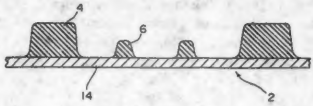
**Continuation of Ser. No. 574,302, Jan. 26, 1984, abandoned. This application Feb. 12, 1985, Ser. No. 700,856**

**Claims priority, application Japan, Feb. 7, 1983, 58-17512**

**Int. Cl.[4] G03F *7/02***

**U.S. Cl. 430—306** **12 Claims**

1. A method of producing printing plates possessing microdots in non-image area comprising a photocurable polymer composition having oxygen inhibition characteristics on top of a backing sheet; placing an image carrier having a microdot pattern image and a printing image, adjacent but spaced apart from the polymer composition; and applying actinic radiation



to the polymer composition in an oxygen-containing atmosphere through the image carrier.

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**4,610,951**

## PROCESS OF USING A FLEXIBLE, FAST PROCESSING PHOTOPOLYMERIZABLE COMPOSITION

**Melvin A. Lipson, Fullerton; Gene A. Derrico, Garden Grove; Sung Y. Tark, Irvine, and Toshio Yamazaki, Mission Viejo, all of Calif., assignors to Dynachem Corporation, Tustin, Calif.**

**Division of Ser. No. 501,199, Jun. 6, 1983, Pat. No. 4,539,286. This application Jul. 25, 1985, Ser. No. 746,685**

**Int. Cl.[4] G03C *5/00***

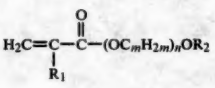
**U.S. Cl. 430—313** **10 Claims**

1. A process for preparing a printed circuit board comprising:

A. laminating a photopolymerizable composition onto a printed circuit board precursor, said photopolymerizable composition being in the form of a storable sheet or roll on a peelable support which on a 100 parts by weight basis consists essentially of:

1. from about 10 to about 60 parts by weight of an addition polymerizable material comprised of

(a) from about 5 to about 50 parts by weight of an acrylate having a boiling point greater than about 175° C. and having the formula



wherein m is from 1 to 4, n is from 1 to 12, $R_1$ is selected from the groupd consisting of H, $CH_3$ and mixtures thereof and $R_2$ is selected from the group consisting of unsubstituted phenyl, substituted phenyl, unsubstituted naphthenyl, substituted naphthenyl, branched or unbranched, substituted or unsubstituted alkyl having 1 to 12 carbon atoms, substituted or unsubstituted cycloalkyl having 5 or 6 carbon atoms in the ring and mixtures thereof and

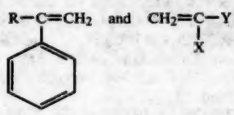
(b) from about 5 to about 50 parts by weight of one or more non-gaseous compounds, containing at least two terminal ethylenic groups and having a boiling point about 100° C;

2. from about 0.001 to about 20 parts by weight of a photoinitiated free-radical generating addition polymerization initiating system;

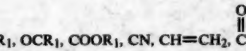
3. from about 0.001 to about 5 parts by weight of thermal-addition polymerization inhibitor; and

4. from about 40 to about 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

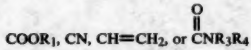
(i) a first monomeric material which contains one or more non-acidic compounds selected from the group having the general formulas



wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group and wherein, when X is hydrogen, Y is



when X is methyl, Y is



and when X is chlorine, Y is Cl, and wherein $R_1$ if an alkyl group having from 1 to 12 carbon atoms, a phenyl group or a benzyl group and $R_3$ and $R_4$ are hydrogen, an alkyl group having from 1 to 12 carbon atoms or a benzyl group; and

(ii) a second monomeric material which consists essentially of one or more alpha, beta-ethylenically-unsaturated carboxylic acid- or anhydride-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render substantially all of the binding agent soluble in a substantially wholly aqueous solution containing 1% by weight of sodium carbonate;

B. exposing selected portions of the photopolymerizable composition to actinic radiation sufficient to obtain photopolymerization of said exposed portions;

C. removing the unexposed portions of the composition to bare portions of the circuit board precursor by contact with a substantially wholly aqueous solution having an alkalinity at least as great as a 1% by weight solution of sodium carbonate;

D. modifying the bared portions of the circuit board precursor to form a selective electrically conductive pattern; and

E. stripping the exposed selected portions of the composition from the circuit board by contact with a substantially wholly aqueous solution having an alkalinity at least as great as 3% by weight solution of sodium hydroxide.

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**4,610,952**

## PHOTORESIST COMPOSITIONS AND METHOD

**James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 531,977, Sep. 14, 1983, Pat. No. 4,537,854. This application Apr. 22, 1985, Ser. No. 725,614**

**Int. Cl.[4] G03C** *5/16, 1/74*

**U.S. Cl. 430—325** **1 Claim**

1. A method of patterning a photoresist on a substrate which comprises

(1) applying photocurable composition on a substrate which photocurable composition comprises

(A) 50 to 98% of a solvent, and

(B) 2 to 50% of a photoresist composition comprising

(i) 100 parts of a water soluble hydroxyl functional film forming organic oligomer,

(ii) 50 to 100 parts of an alkanolacrylamide, and

(iii) an amount of an onium salt which is sufficient to effect the cure of the photoresist elected from the class consisting of

$[Ar_3I]^+[MF]_d^-$, and

$[Ar_3S]^+[MF]_d^-$,

(2) heating the treated substrate to a temperature in the range of from 50° C. to 150° C. to produce a dry film on the treated substrate,

(3) contacting the treated substrate with a mask and irradiating the substrate, and

(4) developing the treated substrate in water to produce a patterned photoresist on the surface of the substrate, where Ar is selected from $C_{(6-13)}$ aromatic hydrocarbon radical and substituted aromatic hydrocarbon radical, M is a metalloid selected from phosphorous, arsenic and antimony and d is an integer equal to 4–6 inclusive.

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**4,610,953**

## AQUEOUS DEVELOPER SOLUTION FOR POSITIVE TYPE PHOTORESISTS WITH TETRAMETHYL AMMONIUM HYDROXIDE AND TRIMETHYL HYDROXYETHYL AMMONIUM HYDROXIDE

**Koichiro Hashimoto, Chigasaki; Shirushi Yamamoto, Isehara; Hisashi Nakane, Kawasaki, and Akira Yokota, Yamato, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan**

**Filed May 29, 1984, Ser. No. 614,908**

**Claims priority, application Japan, May 28, 1983, 58-93345**

**Int. Cl.[4] G03C** *5/00*

**U.S. Cl. 430—331** **4 Claims**

1. A temperature-independent aqueous developer solution for a positive type photoresist which comprises:

(a) 0.5 to 3.0% by weight, based on the developer solution, of tetramethyl ammonium hydroxide;

(b) 1.0 to 4.0% by weight, based on the developer solution, of trimethyl hydroxyethyl ammonium hydroxide; and

(c) water as the solvent of the components (a) and (b).

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**4,610,954**

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Masaaki Torigoe; Yoshio Inagaki, and Tadao Shishido, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Nov. 8, 1984, Ser. No. 669,297**

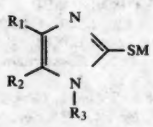
**Claims priority, application Japan, Nov. 8, 1983, 58-209529; Nov. 8, 1983, 58-209530**

**Int. Cl.[4] G03C** *1/34*

**U.S. Cl. 430—445** **23 Claims**

1. A silver halide photographic light-sensitive material for obtaining a silver image comprising a water-impermeable support having at least one silver halide emulsion layer, and containing in association with said emulsion layer a compound selected from the group consisting of:

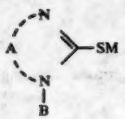
(a) a compound represented by the following general formula (I):



(I)

wherein $R_1$ and $R_2$, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group or a hetero ring group, $R_3$ represents a phenyl group containing at least one carboxyl group, and M represents a hydrogen atom, $NH_4$ or an alkali metal atom;

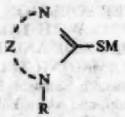
(b) a compound represented by the following general formula (II):



(II)

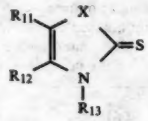
wherein A represents an atomic group necessary for forming an imidazole ring, B represents an aryl or a hetero ring group each substituted with at least one sulfo group, and M represents a hydrogen atom, $NH_4$ or an alkali metal atom; and

(c) a combination of a compound represented by the following general formula (III) and a compound represented by the following general formula (IV):



(III)

wherein M represents a hydrogen atom, $NH_4$ or an alkali metal atom, R represents a hydrogen atom, an alkyl group or an aryl group, and Z represents an atomic group necessary for forming an optionally substituted, 5-membered hetero ring or an atomic group necessary for forming a 5-membered hetero ring fused with a benzene ring; and



(IV)

wherein X is selected form the group consisting of a sulfur atom, an oxygen atom, a selenium atom, $>N-R_{14}$, wherein $R_{14}$ represents an alkyl group, an aralkyl group or an aryl group, and —CH=CH—, $R_{11}$ and $R_{12}$, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group or an alkoxycarbonyl group, provided that $R_{11}$ and $R_{12}$ may combine to form a 5- or 6-membered ring, and $R_{13}$ represents an alkyl group, an aralkyl group or an aryl group.

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**4,610,955**

## ANTISTATIC COMPOSITIONS COMPRISING POLYMERIZED OXYALKYLENE MONOMERS AND AN INORGANIC TETRAFLUOROBORATE, PERFLUOROALKYL CARBOXYLATE, HEXAFLUOROPHOSPHATE OR PERFLUOROALKYLSULFONATE SALT

**Janglin Chen, Rochester; James E. Kelly, Pittsford, and James Plakunov, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 636,764, Aug. 1, 1984, Pat. No. 4,532,781. This application Dec. 24, 1985, Ser. No. 813,189**

**Int. Cl.[4] G03C 1/82**

**U.S. Cl. 430—527** **6 Claims**

1. An antistatic composition comprising a hydrophilic binder, a surface-active polymer having polymerized oxyalkylene monomers and an inorganic salt characterized in that the salt is selected from the group consisting of inorganic tetrafluoroborates, perfluoroalkyl carboxylates, hexafluorophosphates and perfluoroalkyl sulfonates.

**4,610,956**

## PROCESS FOR PRODUCING SUPPORT FOR PHOTOGRAPHIC PAPER AND THE SUPPORT PRODUCED BY THE PROCESS

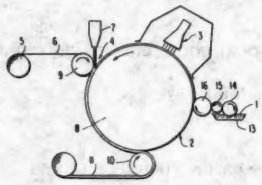
**Tetsuro Fuchizawa; Yasuzi Asao, and Takashi Takayanagi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jan. 9, 1985, Ser. No. 690,027**

**Claims priority, application Japan, Jan. 9, 1984, 59-1666**

**Int. Cl.[4] G03C 1/76**

**U.S. Cl. 430—538** **20 Claims**



1. A process for producing a support for a photographic paper having a layer hardened by irradiation with an electron beam on at least one surface of the support comprising: (1) coating a mixture of (a) an organic compound capable of being hardened by irradiation with an electron beam and (b) a white pigment, on a shaping face to form a layer of said mixture, (2) hardening the layer by irradiation with an electron beam in that state, (3) providing an adhesive layer on the hardened layer, (4) adhering the resulting hardened layer to a base paper through the use of said adhesive layer, and (5) then peeling off the resulting base paper, having thereon the hardened layer, from the shaping face to form said support.

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**4,610,957**

## HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

**Masatoshi Kato, and Hiroshi Kitaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

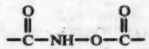
**Filed Apr. 26, 1985, Ser. No. 727,718**

**Claims priority, application Japan, Apr. 27, 1984, 59-85834**

**Int. Cl.[4] G03C 1/02**

**U.S. Cl. 430—542** **20 Claims**

1. A heat-developable light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion, a reducing substance and an acid precursor having a structural moiety represented by the following formula (I) bonded to carbon atoms;



(I)

, said acid precursor being capable of releasing a carboxylic acid when heated.

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**4,610,958**

## PROCESS OF PREPARING A SILVER HALIDE EMULSION

**Shoji Matsuzaka, and Shinya Shimura, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Dec. 5, 1984, Ser. No. 678,333**

**Claims priority, application Japan, Dec. 7, 1983, 58-231944**

**Int. Cl.[4] G03C 1/02**

**U.S. Cl. 430—567** **8 Claims**

1. A process of preparing a monodispersed silver halide emulsion comprising mixing a water-soluble silver salt solution with a water-soluble halide solution in the presence of a protective colloid and thereby forming silver hallide grains, wherein

said silver halide grains consist essentially of octahedral or tetradecahedral silver iodobromide containing at least 4 mole % to 40 mole percent of silver iodide and a tetrazaindene compound is added thereto before finishing the addition of said water-soluble silver salt solution.

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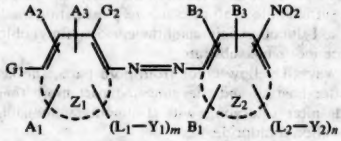
**4,610,959**

## DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

**Shigetoshi Ono; Shigeru Nakamura, and Kazuhiko Matsumoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 20, 1985, Ser. No. 703,575**
**Claims priority, application Japan, Feb. 20, 1984, 59-29940**
**Int. Cl.[4] G03C *5/24***
**U.S. Cl. 430—598** **26 Claims**

1. A direct positive silver halide photographic material comprising a support having thereon at least an internal latent image direct positive silver halide emulsion layer containing a hydrazine nucleating agent, wherein said silver halide emulsion layer or a layer adjacent to the silver halide emulsion layer contains a non-dye image-forming compound represented by following general formula (I) in an amount sufficient for accelerating nucleation;



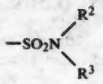

(I)

wherein $Z_1$ and $Z_2$, which may be the same or different, each represents an atomic group necessary for forming a benzene ring or a naphthalene ring; $G_1$ and $G_2$, which may be the same or different, each represents hydrogen or a substituent which does not adversely influence the image; $A_1$, $A_2$ and $A_3$, which may be the same or different, each represents hydrogen or a substituent which does not adversely influence the image; $B_1$, $B_2$ and $B_3$, which may be the same or different, each represents hydrogen or a substituent which does not adversely influence the image; $L_1$ and $L_2$, which may be the same or different, each represents a linkage group; m and n represent 0 or 1; and $Y_1$ and $Y_2$, which may be the same or different, each represents a hydrogen atom or a component having a function of releasing an azo compound from general formula (I) as the result of development

wherein said non-dye image-forming compound represented by general formula (I) is employed in an amount of from 0.0005 to 0.1 millimole/$m^2$,

and wherein when only one of $G_1$ and $G_2$ is the electron attractive atom or group, the other one represents hydrogen, a halogen atom, an alkyl group, an alkoxy group, a cyano group, a nitro group, $—SO_2R^1$ (wherein $R^1$ represents an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group, an aralkyl group, or a substituted aralkyl group), $—NHCOR^1$ (wherein $R^1$ is as defined above), $—NHSO_2R^1$ (wherein $R^1$ is as defined above),

(wherein $R^2$ and $R^3$, which may be the same or different, each represents hydrogen, an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group, an aralkyl group, a substituted aralkyl group, or




(wherein $R^2$ and $R^3$ are as defined above).

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**4,610,960**

## MONOCLONAL ANTIBODY TO THROMBOSPONDIN AND METHOD FOR ASSAYING FOR AND ISOLATING THROMBOSPONDIN

**Deane F. Mosher, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Dec. 21, 1983, Ser. No. 565,024**
**Int. Cl.[4] G01N *33/53*; C12P *21/00*; A61K *39/395*; C12N *5/00***
**U.S. Cl. 435—7** **16 Claims**

1. The hybridoma ATCC HB8432.

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**4,610,961**

## INHIBITION OF REDUCTION ACTIVITIES OF LEUKOCYTES

**Robert F. Guardino, Rochester, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 27, 1982, Ser. No. 453,033**
**Int. Cl.[4] C12Q *1/04, 1/06*; A61K *47/00*; G01N *31/00***
**U.S. Cl. 435—34** **24 Claims**

1. A method for detecting viable leukocytes in an aqueous sample which comprises:

A. contacting one portion of the sample with a reducible indicator which forms a detectable end product upon such contact;

B. incubating the sample of step (A) for a time sufficient to cause formation of said detectable end product of step (A);

C. detecting the amount of end product formed by reduction in step (B);

D. contacting another portion of the aqueous sample with a means for lysing which selectively lyses leukocytes but neither gram-positive for gram-negative bacteria upon such contact, such that the reducing ability of neither gram-positive nor gram-negative bacteria is inhibited;

E. contacting the sample of step (D) with a reducible substrate which forms a detectable end product upon such contact;

F. incubating the sample of step (E) for a time sufficient to cause formation of said detectable end product of step (E);

G. detecting the amount of end product formed by reduction in step (F);

H. detecting the presence of viable leukocytes as a function of the difference between the result in step (C) and the resutl in step (G),

wherein steps (A), (B), (E), and (F) are performed under conditions suitable for the formation of said detectable end products.

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**4,610,962**

## CARRIERS FOR IMMOBILIZATION OF PHYSIOLOGICALLY ACTIVE SUBSTANCES

**Kunihiko Takagi, Kyoto; Masatsugu Mochizuki, Shiga; Izumi Sakamoto, and Hiroichi Teranishi, both of Kyoto, all of Japan, assignors to Unitika Ltd., Hyogo, Japan**

**Filed Jun. 1, 1984, Ser. No. 616,511**
**Claims priority, application Japan, Jun. 3, 1983, 58-99872**
**Int. Cl.[4] C12N *11/12, 11/08*; G01N *33/544*; C08B *16/00***
**U.S. Cl. 435—179** **21 Claims**

1. A carrier for immobilization of physiologically active substances which is prepared by treating an assembly of regenerated cellulose fibers having a single fiber fineness of from 0.5 to 30 deniers and a length of at least 1 millimeter with a solution of a polymer having an acid anhydride group.

## 4,610,963
## NOVEL GLUTATHIONE OXIDASE, ITS PRODUCTION AND USE

Susumu Matsui, Ootsu; Satoko Uchida, Uji, and Tsutomu Taniguchi, Kyoto, all of Japan, assignors to Takara Suzo Co., Ltd., Kyoto, Japan

Filed Dec. 5, 1984, Ser. No. 678,767
Claims priority, application Japan, Dec. 23, 1983, 58-250400; Apr. 18, 1984, 59-78127
Int. Cl.[4] C12N *9/02;* C12Q *1/26;* C12R *1/645*
U.S. Cl. 435—189 7 Claims

1. A novel glutathione oxidase T-1 having the following physicochemical properties:

(1) Action: Acts on reduced glutathione in the presence of oxygen to produce oxidized glutathione and hydrogen peroxide;

(2) Substrate specificity: Acts on reduced glutathione alone, not on other sulfhydryl compounds at all;

(3) Optimum pH and pH stability: Has an optimum pH in the vicinity of 7.0, and is stable between pH 4.0 and pH 8.0 for 60-minute treatment at 37° C.;

(4) Optimum temperature and thermal stability: Has an optimum temperature in the vicinity of 50° C., and is stable up to 60° C. for 10-minute treatment at a pH of 7.0;

(5) Molecular weight: About 450000 by the gel filtration method, and about 55000 by sodium dodecyl sulfate (SDS)-polyacrylamide gel electrophoresis, from which said novel glutathione oxidase T-1 is composed of eight subunits;

(6) Coenzyme: Contains flavine adenine dinucleotide (FAD), a coenzyme, of 4 molecules/molecule;

(7) Isoelectric point: 5.65±0.05;

(8) Interfering agent: $Hg^{2+}$, p-chloromercuribenzoic acid, sodium L-ascorbate, etc;

(9) Sugar content: About 40%.

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## 4,610,964
## NOVEL MICROORGANISM AND ITS USE IN A PROCESS FOR THE PREPARATION OF ALPHA AMYLASE

Arved Lompe, Nienburg, Fed. Rep. of Germany, assignor to Miles Kali-Chemie GmbH & Co. KG, Nienburg, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,468
Claims priority, application European Pat. Off., Dec. 9, 1983, 83112408
Int. Cl.[4] C12N *9/28, 1/20;* C12R *1/125*
U.S. Cl. 435—202 11 Claims

1. biologically pure culture of bacterial strain *Bacillus subtilis* DSM 2704, said strain being capable of producing alpha amylase when cultured in a fermentation medium containing an assimilable source of carbon and an assimilable source of nitrogen.

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## 4,610,965
## ADSORPTION-DESORPTION PURIFICATION OF GLUCOSE ISOMERASE

Richard A. Johnson; Richard L. Antrim, both of Clinton, Iowa, and Norman E. Lloyd, Ridgefield, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Dec. 20, 1984, Ser. No. 684,204
Int. Cl.[4] C12N *9/92*
U.S. Cl. 435—234 15 Claims

1. A process for the production of a purified glucose isomerase which comprises:

(a) contacting an impure extract which has not been previously treated to remove soluble impurities, said extract containing glucose isomerase ans soluble impurities with a weakly basic ion exchange material known to adsorb glucose isomerase,

(b) adding a first salt solution of a concentration of about 0.05-0.2N which removes unadsorbed and weakly adsorbed impurities, but not glucose isomerase.

(c) adding a second, buffered salt solution of a concentration of at least 0.3N which elutes the adsorbed glucose isomerase.

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## 4,610,966
## DANSYL CHLORIDE TESTING METHOD

Alfred E. Fuchs, Denville, N.J., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed May 23, 1984, Ser. No. 613,593
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—2 7 Claims

1. A method of determining the extent of chemical bonding between amino functional group coatings and inorganic substrates which comprises:

dividing a sample of the inorganic substrate to be tested into two parts;

saturating each part with a solution of 1-dimethylaminonaphthalene-5-sulfonyl chloride in a polar organic solvent;

heating one part, but not the other, at a temperature and for a time sufficient to graft or condense the coating modified with the 1-dimethylaminonaphthalene-5-sulfonyl chloride onto the inorganic substrate;

rinsing away all yellow color from both parts, the heated part after heating and the unheated part more than 30 seconds after saturating with 1-dimethylaminonaphthalene-5-sulfonyl chloride; and

comparing, under ultraviolet light in an otherwise substantially dark room, the color intensity of the two parts of the sample.

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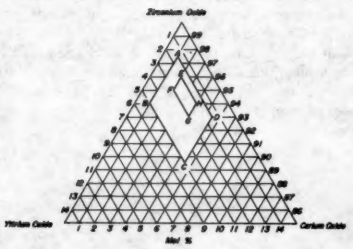
## 4,610,967
## ZIRCONIA PORCELAIN AND METHOD OF MANUFACTURING THE SAME

Yuichiro Imanishi, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 6, 1984, Ser. No. 637,797
Claims priority, application Japan, Dec. 27, 1983, 58-251882
Int. Cl.[4] C04B *35/48, 35/50*
U.S. Cl. 501—103 18 Claims



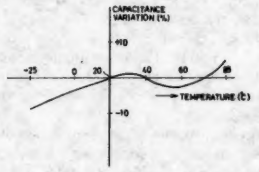

1. A zirconia porcelain ceramic body consisting essentially of 97.5–89.5 mol % of zirconia oxide, 1.5–5 mol % of yttrium oxide and 1–5.5 mol % of cerium oxide.

4,610,968

## LOW TEMPERATURE SINTERED CERAMIC MATERIAL FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE, AND METHOD OF MANUFACTURE

Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,780
Claims priority, application Japan, Nov. 30, 1983, 58-225567
Int. Cl.[4] C04B 35/46; H01G 4/10, 4/12
U.S. Cl. 501—137 1 Claim




1. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$, where M is at least either of magnesium, zinc, strontium and calcium, k is a numeral in the range of 1.00 to 1.04, and x is a numeral in the range of 0.02 to 0.05; and

0.2 to 10.0 parts by weight of an additive mixture of 30 to 90 mole percent boron oxide and 10 to 70 mole percent of at least one metal oxide selected from the group consisting of barium oxide, magnesium oxide, zinc oxide, strontium oxide and calcium oxide the sintered ceramic material providing a dielectric for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1\times10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range of $-25°$ to $+85°$ C.

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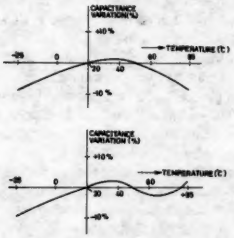
4,610,969

## LOW TEMPERATURE SINTERED CERAMIC MATERIAL FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE, AND METHOD OF MANUFACTURE

Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,796
Claims priority, application Japan, Nov. 30, 1983, 58-225562; Nov. 30, 1983, 58-225563
Int. Cl.[4] C04B 35/46; H01G 4/10, 4/12
U.S. Cl. 501—137 4 Claims




1. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$, where M is at least either of magnesium and zinc and where k is a numeral in the range of 1.00 to 1.04 and X a numeral in the range of 0.02 to 0.05; and

0.2 to 10.0 parts by weight of an additive mixture of lithium oxide and silicon dioxide the sintered ceramic material providing dielectrics for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1\times10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range of $-25°$ to $+85°$ C.

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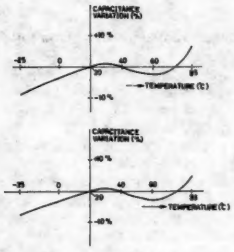
4,610,970

## LOW TEMPERATURE SINTERED CERAMIC MATERIAL FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE, AND METHOD OF MANUFACTURE

Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,652
Claims priority, application Japan, Nov. 30, 1983, 58-225564; Nov. 30, 1983, 58-225565
Int. Cl.[4] C04B 35/4; H01G 4/10, 4/12
U.S. Cl. 501—137 4 Claims




1. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x-y}M_xL_yO_kTiO_2$, where M is at least either of magnesium and zinc, L is at least either of strontium and calcium, k is a numeral in the range of 1.00 to 1.04, x is a numeral in the range of 0.002 to 0.049, y is a numeral in the range of 0.001 to 0.048, and x+y is a value in the range of 0.02 to 0.05; and

0.2 to 10.0 parts by weight of an additive mixture of lithium oxide and silicon dioxide the sintered ceramic material providing dielectrics for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1+10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range $-25°$ to $+85°$ C.

3. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x-y}M_xL_yO_kTiO_2$, where M is as least either of magnesium and zinc, L is at least either of strontium and calcium, k is a numeral in the range of 1.00 to 1.04, x is a numeral in the range of 0.02 to 0.049, y is a numeral in the range of 0.001 to 0.048, and x+y is a value in the range of 0.02 to 0.05; and 0.2 to 10.0 parts by weight of an additive mixture of lithium oxide, silicon dioxide and at least one metal oxide selected from the group consisting of barium oxide, calcium oxide, and strontium oxide, the sintered ceramic material providing dielectrics for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1\times10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range of $-25°$ to $+85°$ C.

4,610,971

## LOW TEMPERATURE SINTERED CERAMIC MATERIAL FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE, AND METHOD OF MANUFACTURE

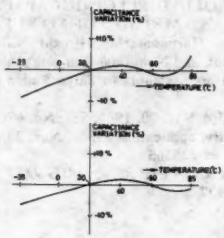
Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,635

Claims priority, application Japan, Nov. 30, 1983, 58-225566; Nov. 30, 1983, 58-225568

Int. Cl.[4] C04B 35/46; H01G 4/10, 4/12

U.S. Cl. 501—137 4 Claims



1. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$, where M is at least either of magnesium, zinc, strontium, and calcium, k is a numeral in the range of 1.00 to 1.04, and x is a numeral in the range of 0.02 to 0.05; and

0.2 to 10.0 parts by weight of an additive mixture of boron oxide and silicon dioxide, the sintered ceramic material providing dielectrics for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1\times10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range of −25° to +85° C.

3. A low temperature sintered ceramic material consisting of:

100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$, where M is at least either of magnesium, zinc, strontium, and calcium, k is a numeral in the range of 1.00 to 1.04, and x is a numeral in the range of 0.02 to 0.05; and 0.2 to 10.0 parts by weight of an additive mixture of boron oxide, silicon dioxide and at least one metal oxide selected form the group consisting of barium oxide, magnesium oxide, zinc oxide, strontium oxide and calcium oxide, the sintered ceramic material providing dielectrics for capacitors having specific dielectric constants of over 2000, dielectric losses of less than 2.5 percent, resistivity of over $1\times10^6$ megohm-centimeters, and temperature dependences of capacitances of plus or minus 10 percent in a temperature range −25° to +85° C.

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4,610,972

## SULPHUR DECONTAMINATION OF CONDUITS AND VESSELS COMMUNICATING WITH HYDROCARBON CONVERSION CATALYST REACTOR DURING IN SITU CATALYST REGENERATION

Thomas R. Hughes, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

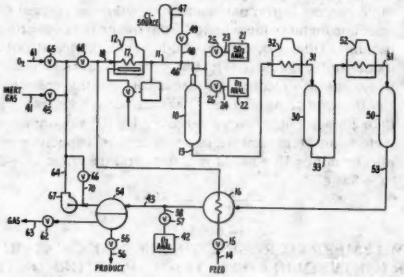
Filed Apr. 18, 1984, Ser. No. 601,685

Int. Cl.[4] B01J 38/14, 29/38, 23/96; C10G 35/08

U.S. Cl. 502—52 32 Claims

1. In a process of regenerating in situ a fixed bed of hydrocarbon conversion catalyst particles, said particles having a platinum group component on a porous inorganic oxide base, which catalyst particles have become contaminated with carbonaceous deposits, said fixed catalyst bed hydrocarbon conversion system having sulfur-contaminated vessels and/or conduits in the flow path upstream from said contaminated catalyst bed, which process includes passing a regenerating oxygen-containing gas through said sulfur-contaminated vessels and/or conduits and then through said catalyst to burn off said carbonaceous deposits under controlled conditions, the improvement which comprises, prior to oxidation of said carbonaceous deposits on said contaminated catalyst particles limiting the oxygen content of said regenerating gas introduced into said upstream sulfur-contaminated vessels and/or conduits to a concentration of not more than 0.1 mol percent and at a temperature in excess of 850° F. to oxidize the sulfur in said contaminated vessels and/or conduits so that the evolved sulfur dioxide flows through said contaminated catalyst particles in the absence of sufficient oxygen to permit conversion of a substantial fraction thereof to sulfur trioxide in the presence of said catalyst and continuing the flow of said gas of limited oxygen content until substantially all the oxidizable sulfur contaminants have been removed from the conversion system.

24. In a process of regenerating in situ a bed of alumina-base reforming catalyst particles containing carbonaceous deposits without modification of the flow path of a reforming system which includes sulfur-contaminated vessels and/or conduits in communication with said bed of catalyst particles, the improvement which comprises prior to oxidation of the carbonaceous deposits on said reforming catalyst particles for regeneration thereof passing an oxygen-containing gas through said sulfur-contaminated vessels and/or conduits at an oxygen



concentration of less than about 0.1 volume percent to oxidize the sulfur contaminants to sulfur dioxide so that during passage thereof through said bed of catalyst particles insufficient oxygen is present in said gas to promote formation of sulfur trioxide, and then increasing the concentration of oxygen in said oxygen-containing gas to at least 0.5 volume percent to oxidize said carbonaceous deposits on said catalyst.

29. In a process of regenerating a catalyst having a platinum group component and a halogen component on an alumina base, said catalyst containing carbonaceous deposits developed during normal hydrocarbon processing in a reaction system which includes upstream sulfur-contaminated vessels and/or conduits in communication with the catalyst, and said process includes passing an oxygen-containing gas at a temperature of not more than about 750° F. through such upstream sulfur-contaminated vessels and/or conduits and then through a bed of said catalyst in the reactor to burn said carbonaceous deposits from said catalyst and then increasing the temperature of said gas to at least 900° F. to redisperse the platinum component on said base, with or without addition of halide,

the improvement comprising prior to burning said carbonaceous deposits from said catalyst flowing said oxygen-containing gas at a concentration of not more than about 0.1 mole % and at a temperature in excess of 850° F. to oxidize the sulfur in said contaminated vessels and/or conduits so that the evolved sulfur dioxide flows through said catalyst bed in the absence of sufficient oxygen to permit

conversion of a substantial fraction thereof to sulfur trioxide by contact with said catalyst.

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4,610,973

## HYDROCARBON CONVERSION CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Feb. 8, 1985, Ser. No. 699,919

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—65 21 Claims

1. A catalyst comprising at least one hydrogenation component, a crystalline aluminosilicate zeolite having catalytic activity for cracking hydrocarbons, and a dispersion of silica-alumina in a matrix consisting essentially of alumina, wherein said catalyst comprises particles in the shape of a three-leaf clover.

2. A catalyst as defined by claim 1 wherein said hydrogenation component is selected from the group consisting of Group VIII and Group VIB metals, their oxides and sulfides.

5. A catalyst as defined by claim 1 wherein said zeolite is a Y zeolite having a silica-to-alumina mole ratio between 3.5 and 6.0, a surface area between 500 and 700 $m^2$/gram, and an ion-exchange capacity when in the sodium form less than 20 percent that of a sodium Y zeolite of comparable silica-to-alumina mole ratio.

7. A catalyst as defined by claim 5 wherein said zeolite contains cations selected from the group consisting of hydrogen ions and rare earth cations.

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4,610,974

## INTERMETALLIC COMPOUNDS OF LEWIS BASE BRIDGED TRANSITION METAL-REDUCING METAL COMPLEXES AND CATALYTIC USE THEREOF

Anthony N. Speca, Kingwood, Tex., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 483,054, Apr. 7, 1983, Pat. No. 4,513,095, Ser. No. 578,243, Feb. 2, 1984, Pat. No. 4,536,487, and Ser. No. 578,244, Feb. 2, 1984, Pat. No. 4,540,680, each is a continuation-in-part of Ser. No. 209,223, Nov. 24, 1980, abandoned, Ser. No. 209,224, Nov. 24, 1980, abandoned, Ser. No. 209,225, Nov. 24, 1980, abandoned, Ser. No. 209,226, Nov. 24, 1980, abandoned, Ser. No. 209,227, Nov. 24, 1980, abandoned, Ser. No. 209,228, Nov. 24, 1980, abandoned, Ser. No. 209,229, Nov. 24, 1980, abandoned, and Ser. No. 228,831, Jan. 27, 1981, abandoned. This application Apr. 22, 1985, Ser. No. 725,440

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] C08F *4/64, 4/62, 4/68*

U.S. Cl. 502—113 14 Claims

1. Lewis base bridged compounds comprising the reaction product of a transition metal alkoxide with a reducing metal having a higher oxidation potential than the transition metal in the presence of a Lewis base, said reaction product being associated by coordinate covalent bridges formed from the Lewis base and composed of donor atoms selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus.

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4,610,975

## CATALYSTS AND METHODS OF THEIR MANUFACTURE

Bruce G. Baker, Torrens Park; Neville J. Clark; Hamish McArthur, both of Bellevue Heights, and Edward Summerville, Everard Park, all of Australia, assignors to The Flinders University of South Australia, Bedford Park, Australia

PCT No. PCT/AU83/00110, § 371 Date Apr. 19, 1984, § 102(e) Date Apr. 19, 1984, PCT Pub. No. WO84/00702, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 19, 1983, Ser. No. 604,655

Claims priority, application Australia, Aug. 19, 1982, PF5478/82

Int. Cl.[4] B01J *21/04, 23/10, 23/30, 23/76*

U.S. Cl. 502—302 20 Claims

1. A method of manufacturing a primary catalyst for conversion of a feed stream comprising carbon monoxide and hydrogen into hydrocarbons, said catalyst comprising a support, an active component comprising iron deposited on the support for catalyzing a reaction in the feed stream to produce hydrocarbons, and a modifier component comprising a rare earth metal deposited on the support to modify the catalytic behavior of the active component to control the length of hydrocarbon chains formed by said reaction, said method comprising forming a coating of the modifier component on the support and simultaneously with or subsequently forming a coating of the active component on the support, there being at least some contact between the coating of the modifer component and the coating of the active component, said support being formed by a method comprising heat treating γ-alumina at a temperature greater than 1100° C. for a time of less than 2 hours to form a material having a crystallographic structure, predominantly indicative of α-alumina, and a surface area intermediate γ-alumina and α-alumina, said material exhibiting basic properties at the surface thereof.

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4,610,976

## PORCINE GRF

Peter Bohlen, Encinitas; Frederick S. Esch, Oceanside; Nicholas C. Ling; Paul E. Brazeau, Jr., both of San Diego, and Roger C. L. Guillemin, La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Aug. 29, 1983, Ser. No. 527,292

Int. Cl.[4] C07K *7/10;* A61K *37/24*

U.S. Cl. 514—12 10 Claims

1. A peptide having the formula: H-Tyr-Ala-Asp-Ala-Ile-Phe-Thr-Asn-Ser-Tyr-Arg-Lys-Val-Leu-Gly-Gln-Leu-Ser-Ala-Arg-Lys-Leu-Leu-Gln-Asp-Ile-Met-Ser-Arg-Gln-Gln-Gly-Glu-Arg-Asn-Gln-Glu-Gln-Gly-Ala-Arg-Val-Arg-Leu-Y wherein Y is OH or $NH_2$, or a nontoxic salt of said peptide.

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4,610,977

## N-ALKYL AND N-BENZYL ADRIAMYCIN DERIVATIVES

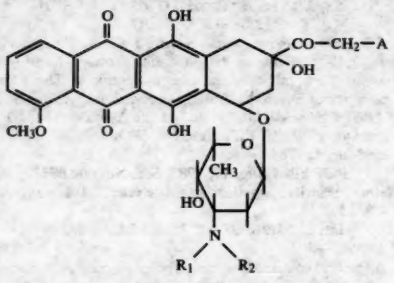
Mervyn Israel, and Ramakrishnan Seshadri, both of Germantown, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Apr. 8, 1985, Ser. No. 720,697

Int. Cl.[4] A61K *31/71;* C07H *15/24*

U.S. Cl. 514—34 10 Claims

1. Compounds having the following structure



in which A is alkanoate having from 4 to 10 carbon atoms, hemiadipate, or hemiglutarate, and in which $R_1$ and $R_2$ are n-propyl or n-butyl, or in which $R_1$ is hydrogen, n-propyl or n-butyl and $R_2$ is benzyl, and their corresponding non-toxic pharmacologically acceptable acid salts.

6. A therapeutic composition exhibiting antitumor activity consisting essentially of a pharmacologically acceptable non-toxic carrier and an effective amount of a compound as claimed in claim 1.

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**4,610,978**

## COMPOSITIONS CONTAINING 1α-HYDROXYCHOLECALCIFEROL FOR TOPICAL TREATMENT OF SKIN DISORDERS AND METHODS EMPLOYING SAME

**Shabtay Dikstein, and Abraham Hartzshtark, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel**

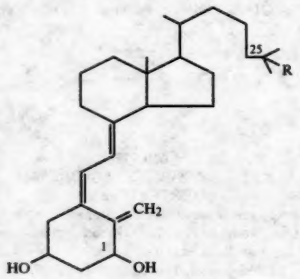
**Filed Mar. 15, 1984, Ser. No. 590,072**

**Claims priority, application Israel, Mar. 22, 1983, 68195; Mar. 22, 1983, 68196**

**Int. Cl.⁴ A61K *31/59, 31/70***

**U.S. Cl. 514—46** **26 Claims**

1. A composition for use in topical treatment of skin disorders selected from the group consisting of dermatitis, eczema, psoriasis, lack of adequate skin firmness, dermal hydration and sebum secretion, which comprises between about 0.001 μg and 1.0 μg per gram of the composition of a compound of the formula:



wherein R is H or OH, and a suitable carrier selected from the group consisting of a cream, an ointment and a lotion.

**4,610,979**

## O-ACYL-ALKANEDIOL-PHOSPHOLIPIDS AND PROCESSES FOR THE TREATMENT OF ASTHMA

**Hans-Heiner Lautenschläger, Pulheim; Erich Graf, Kerpen-Horrem, and Sigurd Leyck, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany**

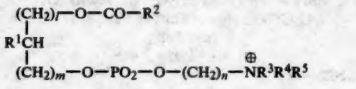
**Filed Feb. 27, 1984, Ser. No. 584,103**

**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307925**

**Int. Cl.⁴ A61K *31/685;* C07F *9/09***

**U.S. Cl. 514—77** **6 Claims**

1. O-Acyl-alkanediol-phospholipids of the general formula I



wherein $R^1$ is a member selected from the group consisting of the straight chain and branched chain alkyl groups having from 10 to 20 carbon atoms and the straight chain and the branched chain alkylene groups having from 10 to 20 carbon atoms, $R^2$ is a member selected from the group consisting of hydrogen, the straight chain and the branched chain alkyl groups having from 1 to 4 carbon atoms and the group $—NR^6R^7$, $R^3$, $R^4$ and $R^5$, which may be the same or different from each other, each are a member selected from the group consisting of hydrogen and the lower alkyl groups having from 1 to 4 carbon atoms, $R^6$ and $R^7$ which may be the same or different from each other, each represent member selected from the group consisting of alkyl groups having from 1 to 20 carbon atoms and alkylene groups having from 1 to 20 carbon atoms, the unsubstituted phenyl group, phenyl substituted by $C_{1-3}$-alkyl, $C_{1-3}$-alkoxy, halogen or trifluoromethyl, and the aralkyl groups, l and m, which may be the same or different from each other, represent 0 or 1 except that l and m may not both be zero, and m represents a whole number from 2 to 4.

6. Process for the treatment of asthma in human beings wherein an O-acyl-alkanediol-phospholipid as claimed in claim 1 is administered to a human being suffering therefrom 2 to 3 times daily in a dose of 1 to 1000 mg. per dose.

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**4,610,980**

## 1,2-DINITRO-4-(3'-CHLORO-5'-TRIFLUOROMETHYL)-2-PYRIDYLOXY-BENZENE HAVING HERBICIDAL PROPERTIES

**Ludwig Maier, Arlesheim; Hermann Rempfler, Ettingen, and Dieter Dürr, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

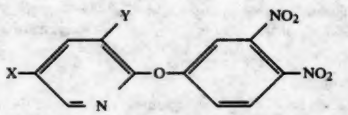
**Division of Ser. No. 399,504, Jul. 19, 1982, Pat. No. 4,451,284. This application Feb. 27, 1984, Ser. No. 592,496**

**Claims priority, application Switzerland, Jul. 28, 1981, 4891/81**

**Int. Cl.⁴ C07D *213/64;* A01N *43/40***

**U.S. Cl. 514—94** **3 Claims**

1. A compound of the formula



wherein X is $—CF_3$ and Y is —Cl.

3. A method of controlling weeds, which comprises applying to said weeds, to parts thereof or to the locus thereof, an effective amount of a compound of the formula according to claim 1.

4,610,981

## N-[(1H-IMIDAZOL-1-YL) AND (1H-1,2,4-TRIAZOL-1-YL)-ALKYL]BENZENESULFONAMIDES AND THROMBOXANE SYNTHETASE/ANTIHYPERTENSIVE COMPOSITIONS

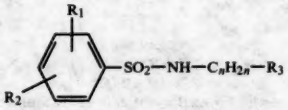
Joseph W. Marsico, Jr., Pearl River, N.Y., and William B. Wright, Jr., Woodcliff Lake, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,575

Int. Cl.[4] A61K *31/635, 31/415, 31/41;* C07D *233/64*

U.S. Cl. 514—158 21 Claims

1. A compound selected from the group consisting of those of the formula:



wherein $R_1$ and $R_2$ are the same or different and are each hydrogen, halogen, alkoxy ($C_1$–$C_3$) or acetylamino, $R_3$ is 1H-imidazol-1-yl or 1H-1,2,4-triazol-1-yl, and n is an integer from 2 to 8 inclusive; and the pharmacologically acceptable acid-addition salts thereof.

16. A method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal a thromboxane synthetase enzyme inhibiting amount of a compound of claim 1.

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4,610,982

## ANTI-INFLAMMATORY BENZO- AND THIENO-1,2-THIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

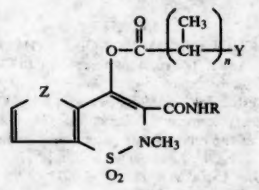
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,466

Int. Cl.[4] A61K *31/38;* C07D *279/02, 513/04*

U.S. Cl. 514—225 14 Claims

1. A compound of the formula:



wherein

R is 2-pyridyl, 6-methyl-2-pyridyl, 6-fluoro-2-6-chloro-2-pyridyl, 5-methyl-3-isoxazolyl or 2-thiazolyl;

Y is 4-isobutylphenyl, 3-phenoxyphenyl, 3-benzoylphenyl,-2-acetoxyphenyl, 6-methoxynaphth-2-yl or 2-fluoro-4-biphenylyl;

Z is —CH=CH— or S; and n is zero or one, with the proviso that n is one when Y is other than 2-acetoxyphenyl and n is zero when Y is 2-acetoxyphenyl.

14. A method for treating inflammatory conditions in a warm-blooded animal, which comprises administering to said animal an effective anti-inflammatory amount of a compound as claimed in claim 1.

4,610,983

## N-ACYL ACIDIC AMINO ACID DIAMIDE DERIVATIVE, A SALT THEREOF, AND AN ANTI-ULCER AGENT CONTAINING THE SAME

Noboru Takagawa; Shiro Hirai; Takuya Kodama, all of Toyama; Hiroshi Hirano, Koyabe; Yasuo Kiba, Toyama; Mikio Kawabata, Kurobe; Tatsuya Miyaura, and Yasuyuki Suzuki, both of Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

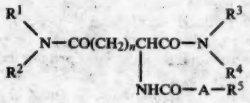
Filed Dec. 3, 1984, Ser. No. 677,466

Claims priority, application Japan, Jun. 12, 1984, 59-120584

Int. Cl.[4] A61K *31/34, 31/16;* C07D *307/54;* C07C *103/147*

U.S. Cl. 514—230 22 Claims

1. An N-acyl acidic amino acid diamide derivative represented by the general formula or a salt thereof:



wherein each of $R^1$, $R^2$, $R^3$ and $R^4$, which may be the same or different, represents a hydrogen atom or a $C_{1-8}$alkyl, $C_{3-7}$cycloalkyl, $C_{2-4}$alkenyl, benzyl, phenethyl or naphthylmethyl group, or $R^1$ and $R^2$ and/or $R^3$ and $R^4$, when taken together with the respective adjacent nitrogen atom, form a pyrrolidinyl, piperidyl, piperazinyl or morpholinyl group, and $R^5$ represents a heterocyclic group selected from thienyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrrolidinyl, pyrrolinyl, imidazolidinyl, imidazolinyl, pyrazolidinyl, triazolyl, tetrazolyl, tetrahydrofuryl, pyranyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, piperidyl, piperazinyl, morpholinyl, triazinyl, thiazinyl, benzothienyl, benzofuryl, isobenzofuryl, indolyl, isoindolyl, indazolyl, purinyl, quinolyl, isoquinolyl, naphthyridinyl, quinoxadinyl, chromanyl, indolinyl, isoindolinyl, chromenyl and 3,5-epoxy-1-cyclohexenyl, and $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ may be substituted by at least one substituent selected from halogen, hydroxyl, amino, carboxyl, $C_{1-8}$alkyl, oxo, $C_{1-8}$alkoxy, phenyl, naphthyl, chlorophenyl, benzyl, phenethyl, naphthylmethyl, (2,3,4- or 3,4,5-)trimethoxybenzyl, amino-$C_{1-4}$alkyl, di-$C_{1-4}$alkylamino-$C_{1-4}$alkyl, hydroxy-substituted $C_{1-4}$alkyl, $C_{1-5}$alkanoyloxy, styrylcarbonyl, 3,4,5-trimethoxystyrylcarbonyl, benzyloxycarbonylamino, benzyloxycarbonylaminomethyl, benzoylamino, 3,4,5-trimethoxybenzoylamino, pyrrolidinylcarbonylmethyl, piperidylcarbonylmethyl, piperazinylcarbonylmethyl and morpholinylcarbonylmethyl; A represents a bond or a $C_{1-5}$alkylene, $C_{2-5}$alkenylene or $C_{4-6}$alkadienylene group which may be substituted by at least one substitutent selected from $C_{1-8}$alkyl groups hydroxyl group, phenyl group and naphthyl group; and n is 1, 2 or 3.

22. An anti-ulcer agent comprising an anti-ulcer effective amount of the N-acyl acidic amino acid diamide derivative or a salt thereof according to claim 1 in a pharmaceutically acceptable carrier.

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4,610,984

## SUBSTITUTED PIPERAZIN-1-YL-ACETIC ACID AMIDES

Karl Schönafinger, Alzenau; Rudi Beyerle, Frankfurt am Main; Ursula Schindler, Mörfelden-Walldorf; Piero Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt(Main)-Fechenheim, Fed. Rep. of Germany

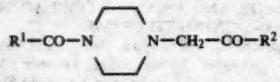
Filed Apr. 18, 1984, Ser. No. 601,637

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315424

Int. Cl.[4] A61K *31/495;* C07D *295/18, 295/20, 409/12*

U.S. Cl. 514—235 9 Claims

1. A piperazin-1-yl-acetic acid amide of the formula I



(I)

wherein $R^1$ denotes phenyl, phenyl which is substituted by one, two or three independent substituents from the group comprising ($C_1$–$C_4$)—alkyl, —O—($C_1$–$C_4$)—alkyl, acetoxy, —CO—O-($C_1$–$C_4$)—alkyl, —$SCH_3$, —$NH_2$, —NH—($C_1$–$C_3$)—alkyl, —N(($C_1$–$C_2$)—alkyl)$_2$, —F, —Cl, —Br, —I, —OH, and —SH, or pyridyl, thienyl, furyl, chlorophenoxymethyl, amino, alkyl-amino with 1 to 5 C atoms, phenylamino, phenylamino which is substituted in the phenyl nucleus by —Cl, —Br, —$CH_3$, or —$OCH_3$, or alkoxy with 1 to 4 C-atoms, $R^2$ denotes amino, alkylamino with 1 to 4 C atoms, dialkylamino with 1 to 4 C atoms in each alkyl radical, morpholino, 4-methyl-piperazin-1-yl, pyrrolidin-1-yl, piperidino, cyclohexamethyleneimino, diethanolamino, dipropanolamino, —NH($CH_2$)$_n$—$R^3$, —NH($CH_2$)$_m$—$R^4$ or 2-($R^3$—carbonyl)-pyrrolidin-1-yl, $R^3$ denotes hydroxyl, alkoxy with 1 to 4 C atoms or dialkylamino with 1 to 4 C atoms in each alkyl radical, $R^4$ denotes phenyl, methoxyphenyl, methylphenyl, dimethoxyphenyl, dimethylphenyl or pyridyl, n denotes 2 or 3 and m denotes 1 or 2, and their pharmacologically-acceptable acid-addition salts, with the restriction, that in cases in which $R^1$ denotes a phenyl radical substituted by Cl, said phenyl radical cannot have a further substituent selected from the group —OH and O—alkyl($C_1$–$C_4$).

8. A process for treatment of cerebral insufficiency or improving intellectual performance which comprises administering an effective amount of a compound according to claim 1 to a subject afflicted with such illness.

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**4,610,985**

## ALLOPHANATE DERIVATIVE, FUNGICIDAL COMPOSITIONS AND USE

**Wolfgang Führer, Hennef; Engelbert Kühle, Bergisch-Gladbach, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

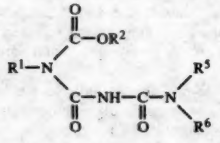
**Filed Apr. 10, 1985, Ser. No. 721,738**

**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414881**

**Int. Cl.**[4] **A01N** *47/20;* **C07C** *125/065, 125/067;* **C07D** *295/20*

**U.S. Cl. 514—235** **9 Claims**

1. An allophanate derivative of the formula



in which

$R^1$ represents $C_5$–$C_{10}$-cycloalkyl, optionally substituted by $C_1$–$C_6$-alkyl, or represents $C_6$–$C_{10}$-aryl, optionally substituted by halogen, nitro, cyano, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy and/or trifluoromethyl,

$R^2$ represents $C_1$–$C_{10}$-alkyl, $C_2$–$C_{10}$-alkenyl or $C_2$–$C_{10}$-alkinyl, optionally substituted by $C_{1-4}$-alkoxy, $C_{1-4}$-alkylthio and/or halogen, or represents $C_5$–$C_{10}$-cycloalkyl, optionally substituted by $C_1$–$C_6$-alkyl, or represents aralkyl with $C_6$–$C_{10}$ in the aryl part and $C_1$–$C_4$ in the alkyl part, optionally substituted in the aryl part by halogen, nitro, $C_1$–$C_6$-alkyl, cyano and/or trifluoromethyl, or represents $C_6$–$C_{10}$-aryl, optionally substituted by halogen, nitro, cyano, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy and/or trifluoromethyl,

$R^5$ and $R^6$ are identical or different and represent hydrogen, $C_1$–$C_{10}$-alkyl or aryl which has 6 to 10 carbon atoms, and is optionally mono-, di-, tri-, tetra- or penta-substituted by identical or different substituents from the group comprising halogen, $C_1$–$C_4$-alkyl and halogenoalkyl and halogenoalkoxy with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, or

$R^5$ and $R^6$, together with the nitrogen atom on which they stand, represent a 5-membered to 7-membered saturated heterocyclic radical, which is optionally substituted by $C_{1-4}$-alkyl and can be interrupted by a further hetero-atom.

7. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

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**4,610,986**

## AMINONAPHTHACENE DERIVATIVES AND THEIR PRODUCTION

**Kikuo Ishizumi, Toyonaka; Michihisa Muramatsu, Osaka; Norihiko Tanno, Ibaragi; Hiromi Sato, Toyonaka, and Noboru Yoshida, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

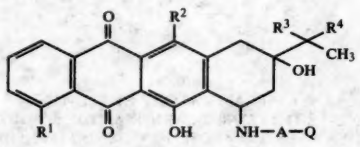
**Continuation-in-part of Ser. No. 397,787, Jul. 13, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,039**

**Claims priority, application Japan, Jul. 29, 1981, 56-119949; Jan. 27, 1982, 57-12134; May 11, 1982, 57-79525**

**Int. Cl.**[4] **A01N** *43/84;* **C07C** *50/16, 97/26, 49/68*

**U.S. Cl. 514—239** **10 Claims**

1. A (7S,9S) isomer or its racemic modification of the aminonaphthacene derivative of the formula:



wherein $R^1$ is a hydrogen atom, a hydroxyl group or a lower alkoxy group, $R^2$ is a hydrogen atom or a hydroxyl group, $R^3$ and $R^4$ are each a lower alkoxy group or, when taken together, represent an ethylenedioxy group or an oxo group, A is an ethylene group optionally bearing at least one lower alkyl and Q is a hydroxyl group, a lower alkoxy group or a dimethylamino group, or an acid addition salt thereof.

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**4,610,987**

## IMIDAZOQUINAZOLIN-2-ONE COMPOUNDS

**Fumiyoshi Ishikawa, Tokyo, Japan, assignor to Daiichi Seiyaku Co., Ltd., Tokyo, Japan**

**Filed Jul. 16, 1984, Ser. No. 631,417**

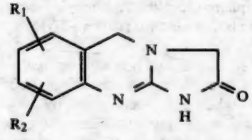
**Claims priority, application Japan, Jul. 14, 1983, 58-128173**

**The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.**

**Int. Cl.**[4] **A61K** *31/505;* **C07D** *487/04*

**U.S. Cl. 514—239** **8 Claims**

1. An imidazoquinazolin-2-one compound represented by the formula (I):

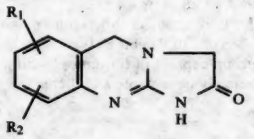


(I)

wherein $R_1$ represents a di-lower alkylamino group having 1 to 6 carbon atoms in its alkyl moiety, an unsubstituted or substi-

tuted cyclic amino group selected from the group of a 1-pyrrolidinyl group, a 1-piperidinyl group, a 1-piperazinyl group and a 4-morpholinyl group, and wherein said cyclic amino group can be substituted by 1 or 2 lower alkyl groups; and $R_2$ represents a hydrogen atom, a halogen atom, a lower alkyl group having 1 to 6 carbon atoms or a lower alkoxy group having 1 to 6 carbon atoms, with proviso that the compound wherein $R_1$ is a 7-piperidino group and $R_2$ is a hydrogen atom is excluded, and a pharmaceutically acceptable salt thereof.

8. An platelet aggregation inhibitor comprising a platelet aggregation inhibiting effective amount of an imidazoquinazolin-2-one compound represented by the formula (I):



(I)

wherein $R_1$ represents a di-lower alkylamino group having 1 to 6 carbon atoms in its alkyl moiety, an unsubstituted or substituted cyclic amino group; selected from the group consisting of a 1-pyrrolidinyl group, a 1-piperidinyl group, a 1-piperazinyl group and a 4-morpholinyl group, and wherein said cyclic amino group can be substituted by 1 or 2 lower alkyl groups; and $R_2$ represents a hydrogen atom, a halogen atom, a lower alkyl group having 1 to 6 carbon atoms or a lower alkoxy group having 1 to 6 carbon atoms, with proviso that the compound wherein $R_1$ is a 7-piperidino group and $R_2$ is a hydrogen atom is excluded, or a pharmaceutically-acceptable salt thereof as an active ingredient, and a pharmaceutically-acceptable carrier.

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**4,610,988**

**1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-(SUBSTITUTED)PIPERAZINES USEFUL FOR ALLEVIATING PAIN**

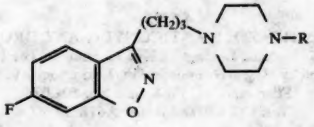
**Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Sommerville, N.J.**

**Division of Ser. No. 366,248, Apr. 9, 1982, Pat. No. 4,536,578. This application Jun. 7, 1985, Ser. No. 742,350**

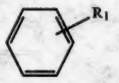
**Int. Cl.[4] A61K** *31/495;* **C07D** *401/04, 413/06*

**U.S. Cl. 514—253** **2 Claims**

1. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain alleviating effective amount of a compound of the formula



wherein R is loweralkyl, benzyl, 2-hydroxyethyl, pyridyl or a group of the formula



wherein $R_1$ is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipodes thereof; or pharmaceutically acceptable acid addition salts thereof.

**4,610,989**

**ANALGESIC COMPOSITION CONTAINING A MIXTURE OF 6-CHLORO-α-METHYL-CARBAZOLE-2-ACETIC ACID PLUS AN OPIATE AS THE ACTIVE AGENT**

**Herman W. Baruth, Jr., Wayne; Leo Berger, Montclair; Alfred J. Corraz, Wayne, and Jerry Sepinwall, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Continuation of Ser. No. 601,411, Apr. 18, 1984, abandoned, which is a continuation of Ser. No. 463,435, Feb. 3, 1983, abandoned, which is a continuation of Ser. No. 323,834, Nov. 23, 1981, abandoned. This application Jul. 31, 1985, Ser. No. 760,800**

**Int. Cl.[4] A61K** *31/44*

**U.S. Cl. 514—282** **10 Claims**

1. A method for producing analgesia which comprises administering to a subject suffering from pain a composition comprising a therapeutically effective dose of a mixture of 6-chloro-α-methyl-carbazole-2 -acetic acid or a salt thereof with a pharmaceutically acceptable base and an opiate compound selected from the group consisting of codeine, morphine, oxycodone or a pharamaceutically acceptable acid addition salt thereof wherein the weight ratio of 6-chloro-α-methyl carbazole-2-acetic acid and said opiate compound is from 1:10 to 10:1.

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**4,610,990**

**5-(1-CYANO-1-ALKYL-N-METHYL-N-METHOXY-PHENETHYL)-ALKYLAMINO-2,2,8-TRIMETHYL-4H-DIOXINO-(4,5-c)-PYRIDINE DERIVATIVES, AND THEIR USE AS CALCIUM ANTAGONISTIC AGENTS**

**André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Paris, France**

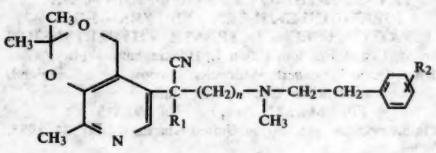
**Filed Oct. 3, 1985, Ser. No. 783,946**

**Claims priority, application United Kingdom, Oct. 23, 1984, 8426738**

**Int. Cl.[4] A61K** *31/395;* **C07D** *491/056*

**U.S. Cl. 514—302** **2 Claims**

1. 5-(1-cyano-1-alkyl-N-methyl-N-methoxy-phenethyl)alkylamino-2,2,8-trimethyl-4H-dioxino-(4,5-c)-pyridine derivatives of the formula



I

wherein n is an integer taking values from 2 to 5 included, $R_1$ stands for a straight or branched lower alkyl up to $C_5$ and $R_2$ stands for two or three $OCH_3$ groups and therapeutically acceptable salts of these compounds.

2. A therapeutic composition comprising as an active ingredient therein, an amount effective to act as a calcium antagonist of a compound according to claim 1 together with an appropriate diluent or carrier.

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**4,610,991**

**ANTIHYPERTENSIVE PYRIDYLAMINOBENZAMIDE COMPOUNDS**

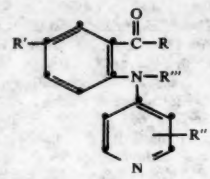
**Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 485,923, Apr. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 388,080, Jun. 14, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,699**

**Int. Cl.[4] A61K** *31/445;* **C07D** *401/12*

**U.S. Cl. 514—318** **24 Claims**

1. A compound having the formula



wherein R is $NH_2$, NH-alkyl having 1–7 carbon atoms, N(alkyl)$_2$ having 2–5 carbon atoms, 1-morpholinyl, 4-methyl-1-piperazinyl, or

wherein

Y is a straight or branched chain alkylene radical having 4–8 carbon atoms and forming with the nitrogen atom a 5–8 membered ring, optionally substituted by a hydroxy group;

R' is H, $O_2N$, halogen, alkyl of 1–3 carbon atoms, alkoxy of 1–3 carbon atoms, HO or Z=$NO_2S$, where Z=N is amino, phenylamino, benzylamino, 4-methylbenzylamino, alkylamino or dialkylamino, alkyl having 1–3 carbon atoms;

R'' is H or alkyl of 1–3 carbon atoms; and

R''' is H, 2-propenyl or alkyl of 1–3 carbon atoms; or a pharmaceutically acceptable acid-addition or quaternary ammonium salt thereof.

21. A composition for lowering the blood pressure of a hypertensive mammal which comprises an antihypertensively effective amount of a compound according to claim 1 together with one or more pharmaceutically acceptable excipients.

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**4,610,992**

**TRANS-4-(2-THIAOXO-1-PYRROLIDINYL OR PIPERIDINYL)-2H-BENZO[B]PYRAN-3-OL DERIVATIVES USEFUL IN TREATING HYPERTENSION**

**John M. Evans, Roydon; Robin E. Buckingham, Welwyn Garden City, and Kenneth Willcocks, Harlow, all of England, assignors to Beecham Group p.l.c., England**

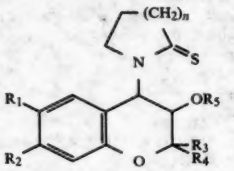
**Filed Mar. 22, 1984, Ser. No. 592,115**

**Claims priority, application United Kingdom, Mar. 24, 1983, 8308064**

**Int. Cl.$^4$ A61K *31/445, 31/40*; C07D *405/04***

**U.S. Cl. 514—320** **9 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of $R_1$ and $R_2$ is hydrogen and the other is $C_{1-6}$ alkylcarbonyl, $C_{1-6}$ alkoxycarbonyl, $C_{1-6}$ alkylcarbonyloxy, $C_{1-6}$ alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, $C_{1-6}$ alkylsulphinyl, $C_{1-6}$ alkylsulphonyl, $C_{1-6}$ alkoxysulphinyl, $C_{1-6}$ alkoxysulphonyl, $C_{1-6}$ alkylcarbonylamino, $C_{1-6}$ alkoxycarbonylamino, $C_{1-6}$ alkyl-thiocarbonyl, $C_{1-6}$ alkoxy-thiocarbonyl, $C_{1-6}$ alkyl-thiocarbonyloxy, 1-mercapto-$C_{2-7}$ alkyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two $C_{1-6}$ alkyl groups, or $C_{1-6}$ alkylsulphinylamino, $C_{1-6}$ alkylsulphonylamino $C_{1-6}$ alkoxysulphinylamino or $C_{1-6}$ alkoxysulphonylamino or ethylenyl terminally substituted by $C_{1-6}$ alkylcarbonyl, nitro or cyano, or —C($C_{1-6}$ alkyl)-NOH or —C($C_{1-6}$ alkyl)$NNH_2$, or one of $R_1$ and $R_2$ is nitro, cyano or $C_{1-3}$ alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two $C_{1-6}$ alkyl groups or by $C_{2-7}$ alkanoyl;

one of $R_3$ and $R_4$ is hydrogen or $C_{1-4}$ alkyl and the other is $C_{1-4}$ alkyl or $R_3$ and $R_4$ together are $C_{2-5}$ polymethylene;

$R_5$ is hydrogen, $C_{1-3}$ alkyl or $C_{1-8}$ acyl;

n is 1 or 2; the thiolactam group being trans to the $OR_5$ group; or, when one of $R_1$ and $R_2$ is an amino or an amino-containing group capable of forming an acid addition salt, a pharmaceutically acceptable salt thereof.

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**4,610,993**

**USE OF SELECTED PYRIDINE-N-OXIDE DISULFIDE COMPOUNDS TO TREAT OR PREVENT BOVINE MASTITIS**

**John H. Wedig, Guilford, Conn.; John G. Babish, Ithaca, N.Y., and Jeffrey Davidson, Tulare, Calif., assignors to Olin Corporation, Cheshire, Conn.**

**Filed Aug. 8, 1984, Ser. No. 638,808**

**The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.**

**Int. Cl.$^4$ A61K *31/44***

**U.S. Cl. 514—335** **8 Claims**

1. A method of treating an animal for bovine mastitis which comprises administering to said animal an effective amount of at least one pyridine-N-oxide disulfide compound to treat or prevent bovine mastitis, said pyridine-N-oxide disulfide compound selected from the group consisting of

(a) 2,2'-dithiobis-pyridine-1,1'-dioxide; and

(b) adducts of 2,2'-dithiobis-pyridine-1,1'-dioxide, the adducts having the formula:

$$(C_5H_4NOS)_2MY_t$$

wherein M is an alkaline earth metal selected from the group consisting of calcium, magnesium, barium and strontium; Y is an anion selected from the group consisting of halides, sulfates, nitrates, chlorates and acetates; and t is either 1 or 2.

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**4,610,994**

**1,2,3-TRIAZOLE ANTICONVULSANT DRUGS**

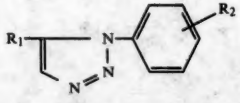
**Pankaja K. Kadaba, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.**

**Filed Apr. 26, 1984, Ser. No. 604,026**

**Int. Cl.$^4$ C07D *401/04*; A61K *31/41***

**U.S. Cl. 514—340** **35 Claims**

1. A compound of the following formula:



wherein $R_1$ is 4-pyridyl, or 3-pyridyl and $R_2$ is m-methyl, m- or p-fluoro, m-chloro, m- or p-bromo, m- or p-trifluoromethyl, 3,4-dichloro, or 3,5-dichloro.

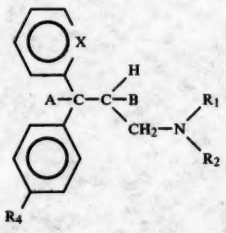
4,610,995

## CERTAIN 1,1-DIARYL-PROPENYL-3-(1-PYRROLIDINO-2-CARBOXYLIC ACIDS, DERIVATIVES THEREOF AND THEIR ANTI-HISTAMINIC PROPERTIES

Geoffrey G. Coker, 80 Pickhurst Park, Bromley, Kent, England, and John W. A. Findlay, Rte. 2, Box 514, Cascade Dr., Chapel Hill, N.C. 27514

Filed Jul. 27, 1984, Ser. No. 635,309
Int. Cl.[4] C07D *401/06;* A61K *31/44*
U.S. Cl. 514—343 4 Claims

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or $C_{1-4}$ alkyl ester thereof; wherein $R_1$ and $R_2$ taken together with the nitrogen to which they are attached form a saturated a heterocyclic ring containing one nitrogen atom and four or five carbon atoms with said ring substituted with the group $R_3CO_2H$ at 2-position wherein $R_3$ is a single bond; $R_4$ is hydrogen, halogen, hydroxy or $C_{1-4}$ alkyl optionally substituted by one or three halogen atoms; X is —N= or —CH=; and —CA—CB— represents —C=C—.

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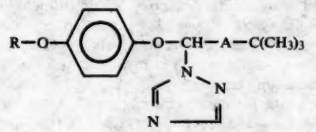
4,610,996

## FUNGICIDAL PHENOXYTRIAZOLYL KETONES AND CARBINOLS

Udo Kraatz, Leverkusen; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,035
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315806
Int. Cl.[4] A01N *43/647, 55/02;* C07D *249/08;* C07F *1/00*
U.S. Cl. 514—383 10 Claims

1. A phenoxy ketone or carbinol of the formula



in which

A represents the keto group or the CH(OH) grouping and

R is alkenyl with 3 to 12 carbons atoms, alkinyl with 3 or 4 carbon atoms, alkenyl which has 3 or 4 carbon atoms and is substituted by chlorine, benzyl or mono- or di-substituted benzyl the substituent being chlorine, or phenoxymethyl which is optionally mono- or di-substituted in the phenyl part by one or two chlorine atoms,

or an addition product thereof with an acid or metal salt.

8. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim 1 in admixture with a diluent.

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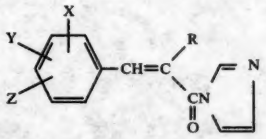
4,610,997

## FUNGICIDAL N-ACYLIMIDAZOLES

Akio Manabe, Ibaraki; Yoshio Hisada, Amagasaki, and Kunihiko Furuzawa, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 19, 1984, Ser. No. 662,640
Claims priority, application Japan, Oct. 25, 1983, 58-199809
Int. Cl.[4] A01N *43/50;* C07D *233/60*
U.S. Cl. 514—397 7 Claims

1. An acylimidazole represented by the formula:



wherein R is a lower alkyl group, and X, Y and Z are, the same or different, each a hydrogen atom, a halogen atom, a lower alkyl group, a halogenated lower alkyl group, a lower alkoxy group, a lower alkylthio group, a cyano group or a nitro group, or two of X, Y and Z, taken together, may form a methylenedioxy group.

6. A method for controlling diseases of plants caused by fungi, which comprises applying a fungicidally effective amount of the compound according to claim 1 to the plants.

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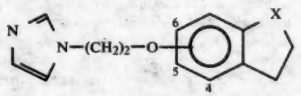
4,610,998

## IMIDAZOLYLETHOXYINDANES AND USE AS ANTITHROMBOTIC AGENTS

Rafael Foguet; Ernesto Forne; Jose A. Ortiz; Aurelio Sacristan, and Jose M. Castello, all of Barcelona, Spain, assignors to Ferrer Internacional, S.A., Barcelona, Spain

Filed Dec. 9, 1985, Ser. No. 807,432
Claims priority, application Spain, Dec. 10, 1984, 539.074
Int. Cl.[4] C07D *233/54;* A61K *31/415*
U.S. Cl. 514—399 12 Claims

1. Imidazolylethoxyindanes represented by the general formula I:



(I)

wherein X is C=O group, a CH—CN group or a CH—COOH group, and the ether group (—O—) is bonded to the indanic group in the 4-, 5- or 6-position thereof, and pharmacologically-acceptable salts thereof.

12. Method for the treatment of thrombotic diseases in a subject in need for the same, comprising the step of administering an effective antithrombotic agent of claim 1 to said patient.

4,610,999

## 4-SUBSTITUTED Δ2-IMIDAZOLINYL-THIOETHERS WITH PROSTAGLANDIN-LIKE ACTIVITY

Gerhard Beck, Frankfurt am Main; Wilhelm Bartmann; Hans-Hermann Laü, both of Bad Soden am Taunus, and Günther Wess, Erlensee, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,772

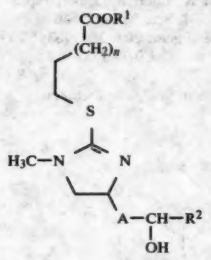
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337181

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/415;* C07D *233/42*

U.S. Cl. 514—401 13 Claims

1. A compound of the formula I



(I)

in which

$R^1$ denotes hydrogen, a straight-chain or branched alkyl radical with up to 8 carbon atoms, a straight-chain or branched unsaturated aliphatic hydrocarbon radical with 3–6 carbon atoms, a cycloaliphatic hydrocarbon radical with 3–7 carbon atoms, an araliphatic hydrocarbon radical with 7–9 carbon atoms or a physiologically acceptable metal ion, $NH_4$ ion or an ammonium ion which is derived from a primary, secondary or tertiary amine, or a tetraalkylammonium ion,

$R^2$ denotes a phenyl radical, which can be mono-, di- or tri-substituted in the nucleus by halogen, trifluoromethyl, alkyl with 1–6 carbon atoms or alkoxy with 1–6 carbon atoms, or denotes a cycloaliphatic radical with 3–8 carbon atoms, a straight-chain or branched alkyl radical with up to 8 carbon atoms or a straight-chain or branched unsaturated aliphatic hydrocarbon radical with 3–8 carbon atoms, it being possible for the aliphatic radicals in turn to be substituted by

(a) a straight-chain or branched alkoxy radical with up to 6 carbon atoms or a straight-chain or branched alkenyloxy or alkinyloxy radical with 3–6 carbon atoms,

(b) halogen, cycloalkyl with 3–7 carbon atoms, an unsubstituted phenyl, α- or β-thienyl or α- or β-furyl radical or a phenyl, thienyl or furyl radical which is in turn mono-, di- or tri-substituted in the nucleus by halogen, trifluoromethyl, alkyl with 1–6 carbon atoms or alkoxy with 1–6 carbon atoms,

(c) an unsubstituted phenoxy, α- or β-thienyloxy or cycloalkoxy radical with 3–7 carbon atoms, or a phenoxy, α- or β-thienyloxy or cycloalkoxy radical with 3–7 carbon atoms, which is in turn mono-, di- or tri-substituted in the ring by halogen, trifluoromethyl or alkoxy with 1–6 carbon atoms,

A denotes a —CH=CH— or —$CH_2$—$CH_2$— group and n denotes the number 0, 1, 2, 3 or 4.

3. A pharmaceutical composition comprising a therapeutically effective amount of a compound of the formula I as recited in claim 1 and a pharmaceutically acceptable excipient for use as a hypotensive, vascular wall relaxant, platelet-aggregating inhibiting, gastric juice inhibiting, or bronchodilating agent.

4,611,000

## 5-SUBSTITUTED Δ2-IMIDAZOLINYL-THIOETHERS WITH PROSTAGLANDIN-LIKE ACTIVITY

Gerhard Beck, Frankfurt am Main; Wilhelm Bartmann; Hans-Hermann Laü, both of Bad Soden am Taunus, and Günther Wess, Erlensee, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,773

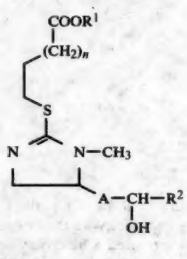
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337180

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/415;* C07D *233/42*

U.S. Cl. 514—401 13 Claims

1. A compound of the formula I



(I)

in which

$R^1$ denotes hydrogen, a straight-chain or branched alkyl radical with up to 8 carbon atoms, a straight-chain or branched unsaturated aliphatic hydrocarbon radical with 3–6 carbon atoms, a cycloaliphatic hydrocarbon radical with 3–7 carbon atoms, an araliphatic hydrocarbon radical with 7–9 carbon atoms or a physiologically acceptable metal ion, $NH_4$ ion or an ammonium ion which is derived from a primary, secondary or tertiary amine, or a tetraalkylammonium ion,

$R^2$ denotes a phenyl radical, which can be mono-, di- or tri-substituted in the nucleus by halogen, trifluoromethyl, alkyl with 1–6 carbon atoms or alkoxy with 1–6 carbon atoms, or denotes a cycloaliphatic radical with 3–8 carbon atoms, a straight-chain or branched alkyl radical with up to 8 carbon atoms or a straight-chain or branched unsaturated aliphatic hydrocarbon radical with 3–8 carbon atoms, it being possible for the aliphatic radicals in turn to be substituted by

(a) a straight-chain or branched alkoxy radical with up to 6 carbon atoms or a straight-chain or branched alkenyloxy or alkinyloxy radical with 3–6 carbon atoms,

(b) halogen, cycloalkyl with 3–7 carbon atoms, an unsubstituted phenyl, α- or β-thienyl or α- or β-furyl radical or a phenyl, thienyl or furyl radical which is in turn mono-, di- or tri-substituted in the nucleus by halogen, trifluoromethyl, alkyl with 1–6 carbon atoms or alkoxy with 1–6 carbon atoms,

(c) an unsubstituted phenoxy, α- or β-thienyloxy or cycloalkoxy radical with 3–7 carbon atoms, or a phenoxy, α- or β-thienyloxy or cycloalkoxy radical with 3–7 carbon atoms, which is in turn mono-, di- or tri-substituted in the ring by halogen, trifluoromethyl or alkoxy with 1–6 carbon atoms,

A denotes a —CH=CH— or —$CH_2$—$CH_2$— group and n denotes the number 0, 1, 2, 3 or 4.

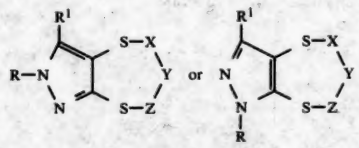
3. A pharmaceutical composition comprising a therapeutically effective amount of a compound of the formula I as recited in claim 1 and a pharmaceutically acceptable excipient for use as a hypotensive, vascular wall relaxant, platelet-aggregating inhibiting, gastric juice inhibiting, or bronchodilating agent.

## 4,611,001
## ANTIMYCOTIC PYRAZOLOTETRATHIEPINS

Bertrand L. Chenard, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1985, Ser. No. 731,730
Int. Cl.[4] A61K *31/55;* C07D *495/04*
U.S. Cl. 514—407 30 Claims

1. A compound having the formula:



(I) (Ia)

wherein

R is alkyl of 1–6 carbon atoms, cycloalkyl of 5–6 carbon atoms, benzyl, or phenyl which may be substituted with up to two groups selected from F, Cl, Br, $NO_2$, or $OCH_3$;

$R^1$ is hydrogen, halogen, or alkyl of 1–6 carbon atoms; and

X, Y, and Z are independently selected from S and $CR^2R^3$ where $R^2$ and $R^3$ individually are alkyl of 1–4 carbon atoms or together are alkylene of 3–6 carbon atoms,

provided that:

(1) one of X, Y, and Z must be $CR^2R^3$ and two of X, Y, and Z are S; and

(2) when R is phenyl; Y must be S.

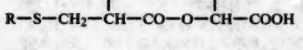
21. A method for the treatment of fungal infections in a mammal comprising administering to the mammal an antimycotic amount of a compound of claim 1.

## 4,611,002
## CARBOXYMETHYL ESTERS OF MERCAPTOPROPANOIC ACIDS AS ENKEPHALINASE INHIBITORS

Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb and Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 815,472, Jul. 14, 1977, abandoned. This application Jun. 8, 1984, Ser. No. 618,720
Int. Cl.[4] A61K *31/22, 31/21, 31/265, 31/405*
U.S. Cl. 514—419 5 Claims

1. A method of relieving pain in a mammalian species, which comprises administering to said mammalian species a composition containing an analgesically effective amount of a compound of the formula



wherein

R is hydrogen or lower alkanoyl;

$R_1$ is hydrogen, alkyl, phenyl-lower alkyl or phenyl;

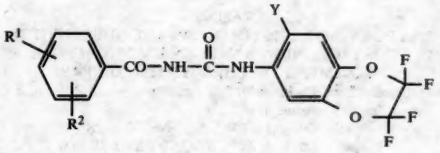
$R_2$ is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, 4-hydroxyphenyl-lower alkyl or indolyl-3-lower alkyl; and salts thereof.

## 4,611,003
## N-SUBSTITUTED BENZOYL-N'-3,4-TETRAFLUOROETHYLENEDIOXY-UREA PESTICIDES

Albrecht Marhold, Leverkusen; Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann, Muelheim; Benedikt Becker, Ratingen; Ingomar Krehan, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,938
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223505
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] A01N *43/02;* C07D *319/14*
U.S. Cl. 514—452 12 Claims

1. A compound of the formula



in which

$R^1$ is hydrogen, halogen, alkylthio or alkyl,

$R^2$ is halogen, and

Y is hydrogen, halogen, alkyl or halogenoalkyl.

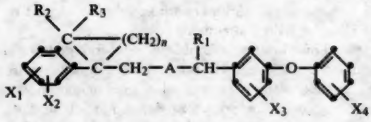
10. A pesticidal composition comprising a pesticidally effective amount of a compound according to claim 1 in admixture with a diluent.

## 4,611,004
## 3-PHENOXYBENZYL-(2-PHENYL-2,2-ALKYLENE-ETHYL) ETHERS AND -THIOETHERS, AND THEIR USE FOR CONTROLLING PESTS

Peter Ackermann, Pfeffingen, and Laurenz Gsell, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 597,009, Apr. 5, 1984, abandoned. This application Mar. 27, 1985, Ser. No. 716,423
Claims priority, application Switzerland, Apr. 12, 1983, 1954/83
Int. Cl.[4] A01N *43/30, 31/14;* C07C *43/267*
U.S. Cl. 514—464 19 Claims

1. A 3-phenoxybenzyl-(2-phenyl-2,2-alkylene-ethyl) ether of the formula



(I)

wherein

A is oxygen or sulfur,

$R_1$ is hydrogen, methyl, cyano or ethinyl,

$R_2$ and $R_3$ are hydrogen, halogen or $C_1$–$C_5$-alkyl,

n is 2 to 4,

$X_1$ is hydrogen, halogen, $C_1$–$C_5$-alkyl, $C_1$–$C_5$-haloalkyl, $C_1$–$C_5$-alkoxy or $C_1$–$C_5$-haloalkoxy,

$X_2$ is hydrogen, halogen or $C_1$–$C_5$-alkyl, or together with $X_1$ in the adjacent position is methylenedioxy, and

$X_3$ and $X_4$ are each hydrogen or halogen.

**19**. A method of controlling various insects and acarids on animals and plants, which method comprises applying thereto or to the locus thereof an effective amount of a compound according to claim **1**.

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**4,611,005**

## 5,6-EPOXY-7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

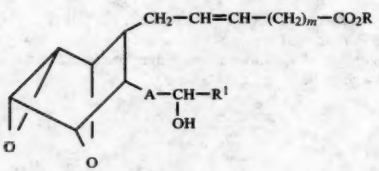
**Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed May 21, 1985, Ser. No. 736,628**

**Int. Cl.**[4] **A61K** *31/335, 31/557;* **C07D** *307/00*

**U.S. Cl. 514—468** **20 Claims**

**1**. A compound having the structural formula



and including all stereoisomers thereof;

wherein m is 1 to 5; A is —CH=CH— or $(CH_2)_2$; R is H, lower alkyl, alkali metal or polyhydroxylamine; and $R^1$ is lower alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl or lower alkenyl containing 2 to 12 carbons, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, hydroxy, amino, alkylamino, $CF_3$, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, nitro, cyano, thiol or alkylthio;

aryl alone or as part of another group contains 6 to 10 carbons in the ring portion and is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, an aryl group, 1 or 2 hydroxy groups, 1 or 2 lower alkoxy groups, 1 or 2 alkylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, or 1 or 2 alkylthio groups;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, and/or 1 or 2 lower alkoxy groups, an aryl group, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups or 1 or 2 alkylthio groups; and

$(CH_2)_m$ includes a straight or branched chain radical having 1 to 5 carbons in the normal chain and may contain 1 or 2 lower alkyl or halo substituents.

**11**. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

**4,611,006**

## 5,6-EPOXY-7-OXABICYCLOHEPTANE SUBSTITUTED ETHERS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

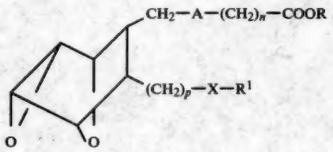
**Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Jun. 28, 1985, Ser. No. 749,912**

**Int. Cl.**[4] **A61K** *31/335;* **C07D** *307/00;* **A61K** *31/557*

**U.S. Cl. 514—468** **15 Claims**

**1**. A compound of the structure



including all steroisomers thereof, wherein A is —CH=CH— or $—CH_2—CH_2—$; n is 0 to 8; p is 1 to 5; X is 0 or

wherein q is 0,1 or 2; R is H, lower alkyl, alkali metal or polyhydroxylamine salt; and $R^1$ is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, lower alkenyl containing 2 to 12 carbons or lower alkynyl containing 2 to 12 carbons, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, $CF_3$, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino or alkylthiol;

aryl alone or as part of another group contains 6 to 10 carbons in the ring portion and in unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxy groups, 1 or 2 lower alkoxy groups, 1 or 2 alkylamino groups or 1 or 2 alkylthio groups;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups, an aryl group, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups or 1 or 2 alkylthio groups; and

$(CH_2)_n$ $(CH_2)_p$ include a straight or branched chain radical having 1 to 8 carbons in the normal chain in the case of $(CH_2)_n$ and having 1 to 5 carbons in the normal chain in the case of $(CH_2)_p$ and may contain 1 or 2 lower alkyl substituents.

**15**. A method for treating peripheral vascular disease, which comprises topically or systemically adminstering to a mammalian host an effective ammount of a compound as defined in claim **1** or a pharmeceutically acceptable salt thereof.

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**4,611,007**

## 7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

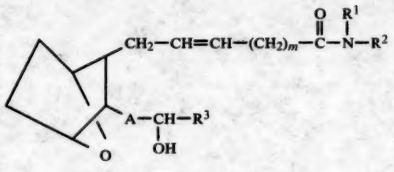
**Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Apr. 22, 1985, Ser. No. 725,976**

**Int. Cl.**[4] **A61K** *31/34, 31/557;* **C07D** *307/00*

**U.S. Cl. 514—469** **12 Claims**

**1**. A compound having the structural formula



and including all stereoisomers thereof;

wherein m is 1 to 5; A is —CH=CH— or $(CH_2)_2$; $R^1$ is hydrogen or lower alkyl, $R^2$ is hydroxy, alkoxy or hydroxyphenyl; and $R^3$ is lower alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, lower alkenyl containing 2 to 12 carbons or lower alkynyl containing 2 to 12 carbons, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, hydroxy, alkylamino, alkanoylamino, nitro, cyano, thiol, alkylthio, $CF_3$, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

aryl alone or as part of another group contains 6 to 10 carbons in the ring portion and is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxy groups, 1 or 2 lower alkoxy groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups, or 1 or 2 $NR^2R^3$ groups or 1 or 2

groups wherein $R^2$ and $R^3$ are independently H, lower alkyl or aryl;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups; and

$(CH_2)_m$ may contain 1 or 2 lower alkyl and/or halo substituents.

**7.** A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction or inhibiting $\Delta^5$-lipoxygenase, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

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**4,611,008**

## PREPARATION OF NITROESTERS FOR CORONARY ARTERY THERAPY

**Walter Heinzelmann, Odenthal, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany**

**Filed Sep. 14, 1984, Ser. No. 650,797**

**Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333639**

**Int. Cl.⁴ A61K** *31/34, 31/21*

**U.S. Cl. 514—470** **9 Claims**

**1.** A gel-containing preparation comprising a coronary-active nitroester selected from the group consisting of nitroglycerin, pentaerythritol tetranitrate and nitroesters of 1,4,3,6-dianhydrosorbide, a pharmaceutically acceptable oil base, and finely disperse silica in the ratio of:

(a) 0.5 to 25.0 wt.-parts of the nitroester, to

(b) 55.0 to 90.0 wt.-parts of the oil base, to

(c) 5.0 to 40.0 wt.-parts of the finely disperse silica, wherein the finely disperse silica consists of 95.0 to 60.0 wt.-% of hydrophilic silica and 5.0 to 40.0 wt.-% of hydrophobic silica.

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**4,611,009**

## COMBATING ARTHROPODS WITH 3-PHENOXYBENZYL 2,2-DIMETHYL-3-VINYLCYCLOPROPANE CARBOXYLATES

**Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 195,026, Oct. 8, 1980, abandoned, which is a division of Ser. No. 135,070, Mar. 28, 1980, which is a division of Ser. No. 916,163, Jul. 16, 1978, Pat. No. 4,276,306. This application Jun. 24, 1982, Ser. No. 391,732**

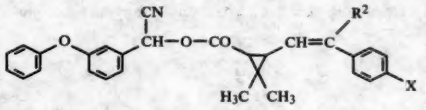
**Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730515**

**The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.**

**Int. Cl.⁴ C07C** *121/60;* **A01N** *43/36*

**U.S. Cl. 514—521** **7 Claims**

**1.** A 3-phenoxybenzyl 2,2-dimethyl-3-vinyl-cyclopropane carboxylate of the formula



in which

$R^2$ is chlorine or bromine, and

X is Cl or F.

**6.** A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a carboxylate according to claim **1**.

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**4,611,010**

## HALOVINYLBENZYL ESTERS AND THEIR USE FOR CONTROLLING PESTS

**Gerd-Ulrich Schwarz, Schifferstadt; Hans Theobald, and Heinrich Adolphi, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

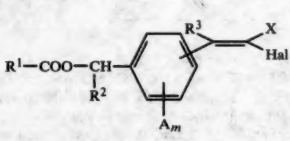
**Filed May 9, 1985, Ser. No. 732,276**

**Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417791**

**Int. Cl.⁴ A01N** *37/34, 53/00;* **C07C** *121/66*

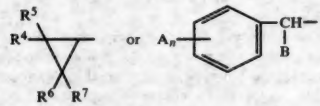
**U.S. Cl. 514—521** **3 Claims**

**1.** Halovinylbenzyl esters of the formula



I

where $R^1$ is



$R^2$ is H, CN, lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl or lower haloalkenyl, $R^3$ is H, halogen or lower alkyl, $R^4$ is H, lower alkyl, lower alkoxy or lower alkoxymethyl, $R^5$ is lower alkyl, lower haloalk(en)yl or lower haloalkynyl, $R^6$ and $R^7$ are each lower alkyl or halogen, A is halogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, CN or $NO_2$, m is 0 to 4, n is 1 to 3, B is lower alkyl, lower alkenyl, lower alkynyl or cycloalkyl, and X is H, halogen, lower haloalkyl, lower thioalkyl, lower alkoxy or lower alkyl, and halogen can be fluorine, chlorine or bromine and, in the case of $R^2$, may furthermore be iodine.

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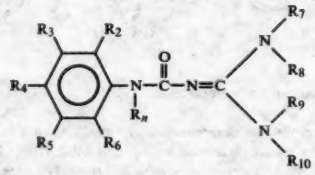
## 4,611,011
## AMIDINOUREAS FOR TREATING IRRITABLE BOWEL SYNDROME

**John Yelnosky, Warrington, and Ghulam N. Mir, Buckingham, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.**

**Filed Jan. 13, 1984, Ser. No. 570,362**
**Int. Cl.[4] A61K** *31/17, 31/55, 31/54, 31/445*
**U.S. Cl. 514—596** **3 Claims**

1. A method for the treatment of irritable bowel syndrome in a constipated patient comprising administering to said patient, one to eight times daily, an anticonstipating effective oral or parenteral dose of about 0.5 to about 10 mg of a compound of the formula



wherein

$R_2$, $R_3$, $R_4$, $R_5$, $R_6$ may be the same or different and are hydrogen, halo, loweralkyl, halologweralkyl, nitro, amino, acylamino, hydroxy, aralkyloxy or loweralkoxy;

$R_7$, $R_8$, $R_9$ and $R_{10}$ may be the same or different and are hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, cycloalkylloweralkyl, alkoxyloweralkyl, aralkoxyloweralkyl or aralkyl;

$R_7$ and $R_8$ together and $R_9$ and $R_{10}$ together may form a 5–7 atom ring which may further include 0–1 hetero atoms of N, O or S;

$R_n$ is hydrogen or loweralkyl;

provided at least one of $R_7$, $R_8$, $R_9$ and $R_{10}$ is other than hydrogen;

or a pharmaceutically acceptable acid addition salt thereof.

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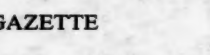
## 4,611,012
## MIXTURES OF ORGANO-TIN COMPOUNDS

**Horst Müller, Fürth/Odenwald, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

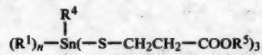
**Continuation of Ser. No. 396,526, Jul. 8, 1982, abandoned. This application Apr. 18, 1985, Ser. No. 724,487**
**Claims priority, application Switzerland, Feb. 22, 1979, 1787/79; Dec. 7, 1979, 10872/79**
**Int. Cl.[4] C08H** *9/10, 9/08;* **C08K** *5/58*
**U.S. Cl. 521—89** **7 Claims**

1. In a foamed polyvinyl halide composition made by using a blowing agent, the improvement which comprises using as the activator for the blowing agent, from 0.1% to about 3% by weight of the polymer of a mixture comprising an organo-tin alcoholate of the formula (I)

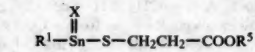


(I)

and an organo-tin mercaptopropionate of the formula (II) or (III)



(II)



(III)

in which formulae $R^1$ is $C_1$–$C_{12}$alkyl, $R^2$ is $C_{10}$–$C_{30}$alkyl or phenyl which is substituted by one or two $C_8$–$C_{12}$alkyl groups, $R^3$ has the meaning assigned to $R^2$ or is the $-Sn(OR^2)(R^1)_2$ group, wherein $R^1$ and $R^2$ are as defined above, X is sulfur or oxygen, $R^4$ is the $-S-CH_2CH_2-COOR^5$ or $-X-Sn(R^1)_n-(S-CH_2CH_2-COOR^5)_{3-n}$ group, in which $R^1$ and X are as defined above, $R^5$ is $C_8$–$C_{14}$alkyl and n is 1 or 2, the weight ratio of I:II or I:III being in the range from 9:1 to 1:9.

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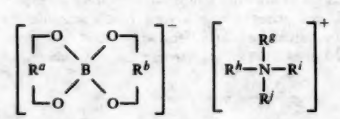
## 4,611,013
## CATALYSTS FOR THE PREPARATION OF CARBODIIMIDE FOAMS AND ELASTOMERS

**Kaneyoshi Ashida, Detroit, Mich., assignor to BP Chemicals Limited, London, England**

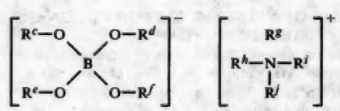
**Filed Jun. 12, 1984, Ser. No. 619,857**
**Int. Cl.[4] C08G** *18/14, 18/16;* **C07C** *107/02*
**U.S. Cl. 521—105** **8 Claims**

1. A process for the preparation of a polyurethane containing carbodimide and/or isocyanurate structures which process comprises reacting an organic polyisocyanate with a compound containing at least two active hydrogen containing groups group in the presence, as catalyst, of an effective amount of a boronium salt containing a quaternary ammonium cation.

6. A process for preparing a compound containing carbodiimide and/or isocyanurate structures which process comprises condensing an organic poly-isocyanate in the presence as catalyst of an effective amount of boronium salt containing a quaternary ammonium cation and which salt has one of the following general formulae:

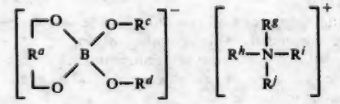


(Type I)



(Type II)

and



(Type III)

where

$R^a$ and $R^b$: are the same or different divalent organic groups containing from 2 to 8 carbon atoms;

$R^c$, $R^d$, $R^e$ and $R^f$: are the same or different monovalent-organic groups having 1 to 20 carbon atoms

$R^g$, $R^h$, $R^i$ and $R^j$: are each a monovalent organic group having 1 to 20 atoms.

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4,611,014

## POROUS POLYMERS

Keith Jomes; Barry R. Lothian; Alexander Martin; Graham Taylor, and Zia Haq, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,306

Claims priority, application United Kingdom, Mar. 5, 1984, 8405680

Int. Cl.[4] C08F *14/00, 114/00*

U.S. Cl. 521—146 7 Claims

1. A highly porous crosslinked functionalised polymer crosslinked from 1-20% and having interconnected cavities or chambers of micron dimensions whose total pore volume is greater than 85% (5.6 cc/g) in its solvent swollen state and having a capacity for spontaneous absorption of aqueous and-/or organic acidic liquids from its dried state of at least 3 g liquid per gram of polymer and having a capacity for acid absorption (aqueous or organic) such that the ratio of aqueous and/or organic acid to neutral oil absorption (defined as methyl oleate) is greater than 1.2, said polymer comprising structural units

in which A represents a crosslinked carbon chain, Y is an optional spacer group and Z is an ionic or polar functional group, selected from amino and substituted amino groups, alkyl cationic quaternary nitrogen groups of 8 or more carbon atoms, alkyl amine oxide groups of 8 or more carbon atoms or alkyl cationic quaternary nitrogen groups of 8 carbons or less only when its counterion is an organic group containing 8 or more carbon atoms, or a mixture of such groups.

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4,611,015

## POLYMER CONCRETE COMPOSITIONS CONTAINING WATER ABSORBENT POLYMERS

Robert E. Hefner, Jr., Lake Jackson, and Deborah I. Haynes, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1984, Ser. No. 681,348

Int. Cl.[4] C08K *3/34, 3/36*

U.S. Cl. 523—408 6 Claims

1. A curable polymer concrete composition which comprises

(A) about 2 to about 20 weight percent of an unsaturated thermosettable composition containing about 1 to about 100 weight percent of one or more ethylenically unsaturated monomers and 0 to about 99 weight percent of one or more ethylenically unsaturated resins,

(B) about 75 to about 97.9 weight percent of an aggregate comprising at least 50 percent by weight of a component selected from the group consisting of sand, gravel, crushed stone or rock, silica flour, fly ash, or mixtures thereof, and

(C) about 0.1 to 5 weight percent of a water absorbent crosslinked polymer.

4,611,016

## BENZOFURANONE OR INDOLINONE COMPOUNDS USEFUL AS STABILIZERS FOR ORGANIC MATERIALS

Hans Hinsken, Kandern, Fed. Rep. of Germany; Horst Mayerhoefer, Oberwil; Wolfgang Mueller, Allschwil, both of Switzerland, and Hermann Schneider, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

Division of Ser. No. 118,054, Feb. 24, 1980, Pat. No. 4,325,863.

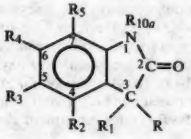
This application Dec. 28, 1981, Ser. No. 335,066

Claims priority, application Switzerland, Feb. 5, 1979, 1104/79; Sep. 28, 1979, 8793/79

Int. Cl.[4] C08K *5/39*

U.S. Cl. 529—99 22 Claims

1. A process for stabilizing organic polymeric materials comprising incorporating therein a stabilizing amount of a compound of formula Ic,

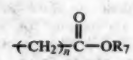


Ic

in which either

R is hydrogen, and

$R_1$ is hydrogen; $C_{1-22}$ alkyl; $C_5$ or $C_6$ cycloalkyl; $C_{1-5}$ alkyl-$C_5$ or $C_6$ cycloalkyl; phenyl; phenyl substituted by one to three substituents selected from the group consisting of $C_{1-12}$alkyl, hydroxy, $C_{1-12}$ alkoxy, $C_{1-18}$acyloxy, chloro or nitro, with the provisos that: (1) when the phenyl ring contains more than one $C_{1-12}$alkyl group, said alkyl groups contain a maximum of 18 carbon atoms, (2) the maximum number of hydroxy substituents is two, and (3) the maximum number of each of the substituents selected from $C_{1-12}$ alkoxy, $C_{1-18}$ acyloxy, chloro and nitro is one; or a group of formula (a/4) or (a/6)



(a/4)

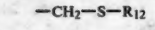
(a/6)

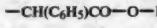
or R and $R_1$ together form a group (a/2)

(a/2)

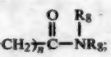
either each of $R_2$ to $R_5$, independently, is hydrogen; $C_{1-12}$ alkyl; $C_5$ or $C_6$ cycloalkyl; $C_{1-5}$ alkyl-$C_5$ or $C_6$ cycloalkyl; hydroxy; $C_{1-22}$ alkoxy; phenoxy; phenoxy substituted by one or two $C_{1-12}$ alkyl groups, said alkyl groups having a maximum of 16 carbon atoms; $C_{1-18}$ acyloxy; chloro; phenyl-$C_{1-9}$alkyl; phenylthio; phenyl-$C_{1-9}$ alkyl or phenylthio substituted on the phenyl ring by one to three substituents selected from $C_{1-12}$ alkyl, hydroxy and $R_{15}CO—O—$; phenyl; phenyl substituted by one or two $C_{1-12}$alkyl groups, said alkyl groups having a maximum of 16 carbon atoms; nitro; 2-furanylcarbonyloxy; 2-thienylcarbonyloxy; a group of formula (b/2), (b/3) or (b/4)

(b/2)


(b/3)


(b/4)

a group of formula (a/4) as defined above; or a group of formula (a/5)


(a/5)

with the provisos that:

(a) a maximum of two of $R_2$ through $R_5$ is $C_5$ or $C_6$ cycloalkyl, $C_{1-5}$ alkyl-$C_5$ or $C_6$ cycloalkyl, hydroxy, $C_{1-22}$ alkoxy, phenoxy, substituted phenoxy, $C_{1-18}$acyloxy or chloro;

(b) a maximum of one of $R_2$ through $R_5$ is optionally substituted phenyl, phenyl-$C_{1-9}$ alkyl or phenylthio, nitro, 2-furanylcarbonyloxy, 2-thienylcarbonyloxy or a group of formula (b/2), (b/3), (b/4), (a/4) or (a/5), provided that only the $R_3$ substituent can be a group of formula (b/3) or (b/4) and only the $R_3$ or $R_5$ substituent can be a group of formula (a/5);

(c) when R and $R_1$ are both hydrogen, $R_2$ to $R_5$ are other than hydroxy; and

(d) when $R_{11}$ in (b/2) is other than hydrogen, such (b/2) group is adjacent to a hydroxy group;

or $R_2$ and $R_3$, together, form a condensed benzene ring,

or $R_4$ and $R_5$, together, form tetramethylene, and one of the two remaining substituents is hydrogen and the other is any one of the significances given for $R_2$ to $R_5$ above;

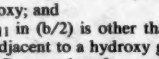
either $R_6$ is $C_{1-12}$ alkyl; phenhl; or 3,5-di-tert.-butyl-4-hydroxyphenyl, and

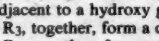
$R_{6a}$ is hydrogen; $C_{1-18}$ alkyl; $C_5$ or $C_6$ cycloalkyl; $C_{1-5}$ alkyl-$C_5$ or $C_6$ cycloalkyl; phenyl or benzyl;

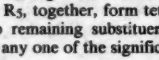
or $R_6$ and $R_{6a}$, together with the carbon atom to which they are bound, form a cyclohexylidene ring;

each $R_7$, independently, is hydrogen; $C_{1-18}$ alkyl, alkyl-O-alkylene having a maximum of 18 carbon atoms; alkyl-S-alkylene having a maximum of 18 carbon atoms; di-$C_{1-4}$ alkylamino-$C_{1-8}$ alkyl $C_{5-7}$ cycloalkyl; phenyl; or phenyl substituted by one to three $C_{1-12}$ alkyl groups, said alkyl groups having a maximum of 18 carbon atoms;

either each $R_8$, independently, is hydrogen; $C_{1-18}$alkyl; $C_5$ or $C_6$ cycloalkyl; $C_{1-5}$alkyl-$C_5$ or $C_6$ cycloalkyl; phenyl; phenyl substituted by one or two $C_{1-12}$ alkyl groups, said alkyl groups having a maximum of 16 carbon atoms; or a group of formula (d/1), (d/2) or (d/3)


(d/1)


(d/2)


(d/3)

or both $R_8$'s, together with the nitrogen atom, form an unsubstituted piperidine or morpholine ring;

$R_9$ has one of the significances of $R_8$;

$R_{9a}$ is hydrogen; $C_{1-18}$ alkyl; or a group of formula (d/1), (d/2) or (d/3) as defined above;

$R_{10a}$ is hydrogen; $C_{1-18}$ alkyl; $C_5$ or $C_6$cycloalkyl; $C_{1-5}$ alkyl-$C_5$ or $C_6$ cycloalkyl; phenyl; phenyl substituted by one or two $C_{1-12}$ alkyl groups, said alkyl groups having a maximum of 16 carbon atoms; or benzyl;

$R_{11}$ is hydrogen; $C_{1-22}$ alkyl, $C_{5-7}$ cycloalkyl; phenyl; phenyl-$C_{1-6}$ alkyl; or phenyl or phenyl-$C_{1-6}$ alkyl substituted on the phenyl ring by one or two $C_{1-12}$ alkyl groups, said alkyl groups having a maximum of 16 carbon atoms;

$R_{12}$ is $C_{1-18}$ alkyl; 2-hydroxyethyl; phenyl; or $C_{1-9}$ alkylphenyl;

$R_{15}$ is $C_{1-22}$ alkyl or phenyl;

and n is 0, 1 or 2.

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**4,611,017**

## STABILIZED CARBOXYL-CONTAINING ETHYLENE INTERPOLYMERS

**Osborne K. McKinney, and David P. Flores, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

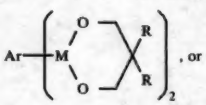
**Division of Ser. No. 528,024, Aug. 31, 1983, Pat. No. 4,500,064, which is a continuation-in-part of Ser. No. 321,668, Nov. 16, 1981. This application Dec. 7, 1984, Ser. No. 679,522**

**Int. Cl.[4] C08K** *5/53*

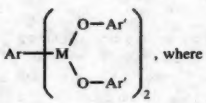
**U.S. Cl. 524—119** **16 Claims**

9. A composition of matter comprising an ethylene/acrylic acid or methacrylic acid interpolymer containing pendant carboxylic acids groups having incorporated therein a minor amount of at least one aromatic bis(organophosphorous) compound conforming to the formula

I.


, or

II.


, where

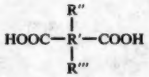
Ar represents biphenylene or phenylene whether substituted or not and where any such substituent groups may be halo, amino, or an alkyl or $C_1$–$C_8$,

Ar' represents, independently of each other, any of the Ar groups described above,

R represents alkyl groups of $C_1$–$C_8$, including substituted alkyl groups, and

M represents P, P═O, or P═S,

and in addition thereto, a minor amount of at least one hindered phenolic antioxidant and/or a minor amount of at least one dicarboxylic acid of the formula



or



where R' represents an aliphatic or aromatic grouping containing $C_1$ to $C_{24}$, and where R'' and R''' each, independently, represent amino, mercapto, phosphato, carboxyl, or hydroxyl group or hydrogen, said carboxyl-containing interpolymer constituting 79 to 99.9% by weight, said hindered phenol constituting 0.01 to 3.0% by weight, said aromatic bis(organophosphorus) compound constituting 0.01 to 3.0% by weight, and said dicarboxylic acid constituting 0.01 to 15% by weight, all based on the total weight of the composition.

4,611,018

## METHOD OF PROCESSING A FLUOROELASTOMER COMPOSITION

Tibor T. Derencsenyi, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 17, 1984, Ser. No. 682,395

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

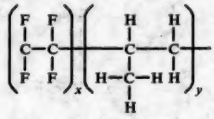
Int. Cl.[4] C08K 5/53

U.S. Cl. 524—130 20 Claims

1. A method of blow molding a fluoroelastomer composition comprising the steps of:

formulating a fluoroelastomer composition consisting essentially of:

(a) about 50–99 weight percent of a fluoroelastomer copolymer of tetrafluoroethylene and propylene having the following structure:



where x=y;

(b) about 0–50 weight percent of a polymer filler;

(c) about 1–25 weight percent of dimethyl methyl phosphonate (DMMP) and;

(d) about 0–15 weight percent of trioctyl phosphate (TOF); loading the composition into a blow molding apparatus; and blow molding the composition into a predetermined shape.

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4,611,019

## ENHANCED BARRIER COMPOSITIONS FROM POLYVINYL ALCOHOL

H. Harald Lutzmann, 2241 Briarwood Rd., Cleveland, Ohio 44118, and Gerald W. Miller, 2165 Cable Car Ct., Cincinnati, Ohio 45244

Filed Jun. 17, 1985, Ser. No. 744,984

Int. Cl.[4] C08K 5/43

U.S. Cl. 524—169 2 Claims

1. A melt extrudable composition consisting essentially of a mixture of a polyvinyl alcohol homopolymer whose degree of hydrolysis is greater than 95% and having a molecular weight range which spans the solution viscosity range of 2 to 30 centipoises at 4% concentration in water at 20 degrees C., from 7 to 15% by weight based on the polyvinyl alcohol homopolymer of a plasticizer selected from the group consisting of aromatic sulfonamides, polyols, aromatic sulfonates, aromatic phosphates and phosphites, N,N-dimethyl amides of fatty acids, alkylene carbonates, alkyl pyrrolidones, and admixtures thereof, and from 0.5 to 4.5% by weight based on the weight of the polyvinyl alcohol homopolymer of a polyamide having a molecular weight of from 15,000 to 30,000 selected from the group consisting of nylon 66, nylon 6, nylon 11, nylon 12, nylon 6,10 copolymer, nylon 6,12 copolymer and grafted nylon.

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4,611,020

## MELAMINE-MODIFIED PHENOLIC TYPE RESIN FOR CONTINUOUS LAMINATION

Leopold F. Bornstein, deceased, late of Atlanta (by Marcia G. Bornstein, executrix), and Gary P. Fillingame, Conyers, both of Ga., assignors to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Jan. 11, 1985, Ser. No. 690,856

Int. Cl.[4] C08G 14/10, 14/12

U.S. Cl. 524—233 10 Claims

1. A fast-curing, melamine-modified, thermosetting phenolic laminating resin having a pH in the range of about 7.0 to about 9.0 comprising

(a) a melamine-modified phenolic resin, and

(b) a water-soluble, organic solvent for said melamine-modified phenolic resin;

said melamine-modified phenolic resin prepared by

(i) forming a reaction mixture containing phenol, aldehyde and melamine, the mol ratio of aldehyde to phenol in said reaction mixture being maintained in the range of about 1.5 to about 3.0 and the mol ratio of phenol to melamine in said reaction mixture being maintained in the range of about 2.0 to about 10.0;

(ii) adjusting the pH of the reaction mixture to within the range of about 7.5 to about 9.5 by adding an inorganic alkaline catalyst;

(iii) co-reacting said reaction mixture of phenol, aldehyde and melamine in the presence of said inorganic alkaline catalyst and at said pH range until said reaction mixture exhibits a Gardner-Holt viscosity within the range of about B to S;

(iv) neutralizing said reaction mixture of step (iii), and

(v) dehydrating said neutralized reaction mixture to a maximum moisture content of about 15% by weight.

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4,611,021

## ETHER MODIFIED POLYESTER RESINS

Otto S. Zamek, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,289

Int. Cl.[4] C08G 63/66

U.S. Cl. 524—317 22 Claims

1. A curable resinous composition comprising the reaction product of

(a) at least one dicarboxylic acid;

(b) at least one aliphatic polyol; and

(c) at least one aromatic bis(ether anhydride) or the corresponding tetracarboxylic acid.

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4,611,022

## POLYMER MODIFIED POLYPHENOL COMPOSITIONS AND THERMOSETTABLE RESINS THEREOF

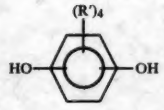
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1985, Ser. No. 747,632

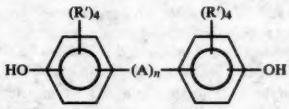
Int. Cl.[4] C08K 5/13, 5/36

U.S. Cl. 524—325 5 Claims

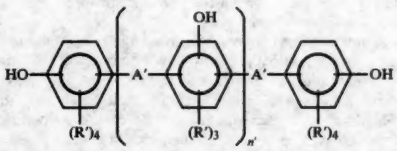
1. A composition which comprises (A) a polyphenol represented by the formulas



(I)



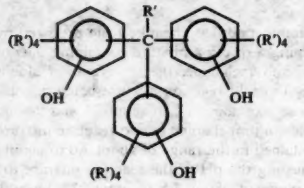
(II)



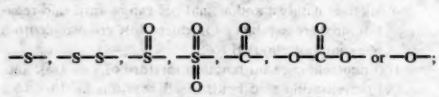
(III)

-continued

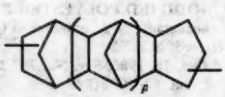
(IV)



wherein each A is independently a divalent hydrocarbon group having from 1 to about 12 carbon atoms,



each A′ is a divalent hydrocarbon group having from 1 to about 3 carbon atoms or a

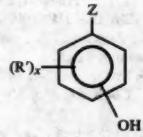


group; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; p has a value of from zero to about 10; n has a value of zero or 1 and n′ has a value from about 0.001 to about 6; and

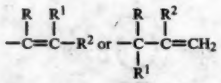
(B) a polymer resulting from copolymerizing

(1) an alkenylphenol or a mixture of alkenylphenols represented by the formula

(V)



wherein Z is a



group; each R, $R^1$ and $R^2$ is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; x has a value of 4; and

(2) a polymerizable ethylenically unsaturated monomer or mixture of such monomers;

wherein component (A) is present in quantities of from about 10 to about 99 percent by weight (%bw); component (B-1) is present in quantities of from about 0.1 to about 50, %bw; component (B-2) is present in a quantity of from about 1 to about 50, %bw and wherein the amount of the individual components is based upon the combined weight of components (A) and (B).

4,611,023

## DI-(SUBSTITUTED HYDROXYPHENYLTHIO) ALKANE AND CYCLOALKANE STABILIZERS AND STABILIZED COMPOSITIONS

John D. Spivak, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

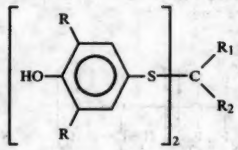
Continuation of Ser. No. 576,691, Feb. 3, 1984, abandoned. This application Jul. 17, 1985, Ser. No. 756,147

Int. Cl.[4] C07C *149/36;* C08K *5/37*

U.S. Cl. 524—326 10 Claims

1. A composition of matter comprising an organic material subject to oxidative, thermal or photo-degradation stabilized with an effective stabilizing amount of a compound of formula I

(I)



wherein

R is tert-butyl,

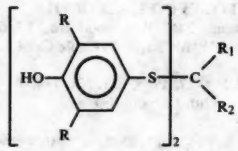
$R_1$ is hydrogen or a straight- or branched-chain alkyl of 1 to 4 carbon atoms,

$R_2$ is a straight- or branched-chain alkyl of 1 to 17 carbon atoms or cyclohex-3-enyl; where $R_1$ and $R_2$ together must have a total of at least 5 carbon atoms.

2. A composition according to claim 1, wherein the organic material is a synthetic polymer.

10. The compound of the formula

(I)



wherein R is tert-butyl,

$R_1$ is hydrogen, and

$R_2$ is cyclohex-3-enyl.

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4,611,024

## PROPYLENE POLYMER COMPOSITION CONTAINING A HYDROTALCITE AND AN ACETAL OF AN ALDITOL

Al R. Wolfe, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Feb. 14, 1985, Ser. No. 702,094

Int. Cl.[4] C08K *5/06*

U.S. Cl. 524—366 20 Claims

1. A composition comprising:

(a) a predominantly propylene polymer;

(b) a clarifying agent comprising an acetal of a 5–7 carbon atom alditol and a 2–8 carbon aldehyde; and

(c) 0.01 to 0.5 weight percent based on the weight of said polymer of a hydrotalcite.

4,611,025

## PROCESS FOR THE PRODUCTION OF THERMOPLASTIC COMPOSITIONS CONTAINING THERMOTROPIC OLIGOMERS AND COMPOSITIONS PRODUCED BY SUCH PROCESS

**Murali K. Akkapeddi, 40 Whitewood Dr., Morris Plains, N.J. 07950; Bruce T. DeBona, 23 Rose Ave., Madison, N.J. 07940; Hsin L. Li, 3 Fernwood Pl., Parsippany, N.J. 07054, and Dusan C. Prevorsek, 21 Harwich Rd., Morristown, N.J. 07960**

**Filed Apr. 4, 1985, Ser. No. 720,103**

**Int. Cl.[4] C08K *3/34***

**U.S. Cl. 524—449** **46 Claims**

5. A polymer blending process which comprises blending a isotropic polymer of high molecular weight which has a fusion temperature at a first temperature, has a glass transition temperature and forms an isotropic liquid above the first temperature, an effective amount of an oligomer having a melting point at a second temperature, said second temperature being not more than 50° C. less than said first temperature, nor more than 70° C. more than said first temperature, said oligomer exhibiting thermotropic behavior between said second temperature and a third temperature, said third temperature being at least about 30° C. above said second temperature and at least about 10° C. above said first temperature, said oligomer having a length to diameter ratio (L/D) of at least about 10, a glass transition temperature at least about 10° C. greater than the glass transition temperature of said polymer, and a Small's solubility parameter within about 7 of the Small's solubility parameter of said polymer in the melt and in the presence of a blending effective amount of an effective partculate material for a time sufficient to form a substantially homogeneous blend of said isotropic polymer and said thermotropic oligomer.

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4,611,026

## EMULSION AND DISPERSION COMPRISING CROSS-LINKED POLYMERIC MICROGEL PREPARED FROM POLYMERIZING EPOXY-CONTAINING MONOMER IN THE PRESENCE OF AN ACID

**Kurt G. Olson, Gibsonia; Suryya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 482,117, Apr. 4, 1983, Pat. No. 4,540,740. This application Jun. 21, 1985, Ser. No. 747,542**

**Int. Cl.[4] C08F *12/22***

**U.S. Cl. 524—548** **10 Claims**

1. An emulsion of crosslinked polymeric particles which are obtained by polymerizing a mixture of polymerizable ethylenically unsaturated monomers which contain greater than 2 percent by weight of a 1,2-epoxy group-containing ethylenically unsaturated monomer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomers, via aqueous emulsion polymerization techniques in the presence of acid having a pKa of −10 to 4 and in which the pH of the aqueous medium is less than 2.5; the 1,2-epoxy group-contaning vinyl monomer and acid being present in amounts sufficient to form crosslinked polymeric particles.

7. A dispersion in which the aqueous emulsion of claim 1 is inverted into organic diluent and the resultant dispersion is at least partially dehydrated.

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4,611,027

## NOVEL ACRYLONITRILE COPOLYMERS

**David J. Steklenski, Rochester; Donald A. Upson, Webster, and Howard M. Low, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 478,937, Mar. 25, 1983, Pat. No. 4,507,385. This application Nov. 29, 1984, Ser. No. 676,154**

**Int. Cl.[4] C08F *222/30***

**U.S. Cl. 524—815** **2 Claims**

1. A polymer selected from the group consisting of poly[n-butyl acrylate-co-acrylonitrile-co-N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium methosulfate] (weight ratio 20/78/2);

poly[ethyl acrylate-co-acrylonitrile-co-N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium methosulfate] (weight ratio 23.9/76/0.1);

poly[vinylidene chloride-co-acrylonitrile-co-N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium methosulfate] (weight ratio 73/25/1.6); and

poly[vinylidene chloride-co-acrylonitrile-co-N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium methosulfate] (weight ratio 58/40/1.6).

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4,611,028

## POLYMERIC DISPERSION STABILIZER AND STABLE DISPERSIONS PREPARED THEREFROM

**Stephen C. Peng, Utica, and John D. Nordstrom, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Continuation of Ser. No. 292,963, Aug. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 199,874, Oct. 23, 1980, abandoned, and Ser. No. 199,396, Oct. 23, 1980, abandoned. This application Dec. 21, 1984, Ser. No. 684,165**

**Int. Cl.[4] C08F *8/00, 220/12;* C09D *3/00;* B01F *17/52***

**U.S. Cl. 524—850** **30 Claims**

1. A stable dispersion in an organic liquid of particles of an addition polymer which are insoluble in said organic liquid, said dispersion being stabilized by a polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B),

said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of

said copolymer reactant (B) which comprises a random copolymer of

(i) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid;

(ii) between about 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially soluble in said organic liquid; and

(iii) between about 2 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A),

said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about ten percent of the complementary functionality of said copolymer reactant (B).

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4,611,029

## PROCESS FOR CONTINUOUSLY HYDROLYZING ETHYLENE-VINYL ACETATE

**Masazumi Takahashi, Itami, Japan, assignor to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 24, 1984, Ser. No. 685,259**

**Claims priority, application Japan, Dec. 29, 1983, 58-249298**

**Int. Cl.[4] C08F *8/00***

**U.S. Cl. 525—61** **11 Claims**

1. A process for continuously hydrolyzing an ethylene-vinyl acetate copolymer in the presence of an alkaline catalyst which comprises feeding a methanol solution consisting essentially of methanol and an ethylene-vinyl acetate copolymer having an ethylene content of 25 to 50% by mole into an upper portion of a tower reactor, supplying all of the alkaline catalyst into a middle portion of the tower in an amount of from 2 to 10 millimoles per 1 mole of vinyl acetate in the ethylene-vinyl acetate copolymer, blowing a methanol vapor into a lower portion of the tower, removing a methyl acetate vapor together with a methanol vapor from the top of the tower and taking out a highly hydrolyzed ethylene-vinyl acetate copoly-

mer having a residual vinyl acetate unit of not more than 0.5% by mole from the bottom of the tower.

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**4,611,030**

**COMPOSITION FOR PNEUMATIC TIRES**

**Masanori Kan, Amagasaki, and Hideo Fujiwara, Kyoto, both of Japan, assignors to Toyo Tire and Rubber Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 461,573, Jan. 27, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,477**

**Claims priority, application Japan, Jan. 28, 1982, 57-12931**

**Int. Cl.[4] C08F *299/00***

**U.S. Cl. 525—99** **4 Claims**

1. A composition for pneumatic tires including more than 30% of star shaped styrene-butadiene copolymers by solution polymerization, with or without one or more types of natural rubbers or diene series synthetic rubbers, the composition value X obtained by the following equation of said styrene-butadiene copolymers being in the range of the lower limit of 26 to the upper limit of 39:

$$X = \text{styrene content (\%)} + \frac{\frac{100 - \text{styrene content}}{100} \times \text{Vinyl content (\%) in BR}}{2}$$

wherein BR being the butadiene component and the vinyl content being the content of 1, 2 bonded butadiene in butadiene component,

said styrene-butadiene copolymers being random copolymers having substantially single glass transition temperature, the coupling efficiency of said styrene-butadiene copolymers in a two-crown part of a distribution graph of molecular weight measured with gel permeation chomatography being more than 40%, the styrene content is less than 20% and more than 10% and the vinyl content is less than 50%.

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**4,611,031**

**PROCESS FOR THE PREPARATION OF A COMPATIBILIZER FOR CONCENTRATED POLYMER BLENDS AND COMPATIBILIZER PRODUCT**

**Richard A. Gallucci, Perkasie; Chung-Yin Lai, West Chester, and Christian D. Neveu, Pennllyn, all of Pa., assignors to Rohm and Haas Company, Phila, Pa.**

**Filed Jan. 28, 1985, Ser. No. 695,316**

**Int. Cl.[4] C08F *255/04, 255/06, 279/02***

**U.S. Cl. 525—310** **7 Claims**

1. A process for preparing a mineral oil soluble compatibilizer for polymer blends of olefin copolymer and polymethacrylate oil additives comprising:

forming a reaction solution by intimately admixing in a solvent:

(a) an oil soluble hydrocarbon backbone polymer;

(b) at least one alkylmethacrylate monomer capable of forming a mineral oil soluble polymer in the absence of the hydrocarbon backbone polymer; and

(c) a free radical initiator capable of hydrogen abstraction, where the concentration of said backbone polymer in said solvent is from about 5 to about 20 percent by weight, said free radical initiator being present at a concentration of from about 0.1 to about 0.4 percent by weight of said admixed components, and said monomers being present at a concentration of at least 80 weight percent on said admixed components, and

graft polymerizing said reaction solution at a temperature of from about 60° C. to about 175° C. until the viscosity of the reaction solution is at least 8000 centistokes at 100° C., the polymer solids content of said reaction solution ranges from about 40 to about 60 percent by weight, and the weight percent conversion of monomers is greater than about 90 percent to form said mineral oil soluble compatibilizer which will stabilize a mixture of separately prepared PMA and OCP oil additive polymers comprising at least 80 weight percent PMS polymer segments and not more than 20 weight percent OCP polymer segments.

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**4,611,032**

**OXIDIZING POLYMERIZATION WITH $NO^{\oplus}$ AND $NO_2^{\ominus}$**

**Gerhard Kossmehl, Berlin, and Jürgen Hocker, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Georg Chatzitheodorou, Berlin, Fed. Rep. of Germany**

**Continuation of Ser. No. 506,604, Jun. 22, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,395**

**Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224157; Jun. 29, 1982, 3224158**

**Int. Cl.[4] C08F *8/42***

**U.S. Cl. 525—360** **4 Claims**

1. Process for the production of doped polymers which comprises reacting polymers consisting essentially of repeating units of 5-atom aromatic rings containing a nitrogen, sulfur or oxygen hetero-atom at −20° C. to 80° C. with a nitronium or nitrosonium salt selected from the group consisting of $NO^{\oplus}BF_4^{\ominus}$, $NO_2^{\oplus}BF_4^{\ominus}$, $NO^{\oplus}PF_6^{\ominus}$, $NO_2^{\oplus}PF_6^{\ominus}$, $NO^{\oplus}SbF_6^{\ominus}$ or $NO^{\oplus}AsF_6^{\ominus}$, $NO_2^{\oplus}AsF_6^{\ominus}$, $NO_2^{\oplus}SbF_6^{\ominus}$, $NO^{\oplus}ClO_4^{\ominus}$ and $NO_2^{\oplus}ClO_4^{\ominus}$.

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**4,611,033**

**PROCESS FOR STABILIZING A POLY(ARYL ETHER KETONE)**

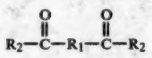
**Louis M. Maresca, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Mar. 11, 1985, Ser. No. 710,120**

**Int. Cl.[4] C08G *67/00***

**U.S. Cl. 525—419** **9 Claims**

1. An improved process for stabilizing a poly(arylether ketone) polymer produced by reacting a nucleophilic coreactant with an electrophilic coreactant under Friedel-Crafts polymerization conditions wherein the improvement comprises treating the polymer so produced with a dicarbonyl chelating agent of the general formula



wherein $R_1$ is a saturated or unsaturated alkyl or cycloalkyl radical containing from 1 to 12 carbon atoms, or —Q—R-3—Q— wherein Q is N or O and $R_3$ is a saturated or unsaturated alkyl or cycloalkyl radical containing 1 to 12 carbon atoms, $R_2$ is independently hydrogen, alkyl, cycloalkyl, or aryl containing from 1 to 12 carbon atoms, —O—$R_4$ wherein $R_4$ is independently hydrogen, alkyl, cycloalkyl or aryl containing from 1–12 carbon atoms or —$N(R_4)_2$ wherein $R_4$ is as defined above.

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**4,611,034**

**BRANCHED THERMOPLASTICALLY PROCESSIBLE IMPACT-RESISTANT POLYAMIDES**

**Rolf-Volker Meyer; Friedrich Fahnler; Rolf Dhein; Dietrich Michael, all of Krefeld; Kurt Weirauch, Bergisch Gladbach, and Walter Schäfer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jul. 1, 1985, Ser. No. 749,999**

**Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425318**

**Int. Cl.[4] C08F *283/04***

**U.S. Cl. 525—420** **7 Claims**

1. A polyamide block copolymer obtained by the activated anionic polymerisation of a lactam having at lease five ring members in the presence of a basic catalyst, a polyisocyanate co-catalyst and an amino-terminated polyether having a degree

of amination of at least sixty percent, a functionality of at least 3 and a molecular weight of >3000.

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4,611,035

## POLYHYDRIDOSILANES AND THEIR CONVERSION TO PYROPOLYMERS

Katherine A. Brown-Wensley, Lake Elmo, and Robert A. Sinclair, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 597,540, Apr. 6, 1984, Pat. No. 4,537,942, which is a continuation-in-part of Ser. No. 579,017, Feb. 10, 1984, abandoned. This application May 1, 1985, Ser. No. 729,365

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—474 10 Claims

1. A method comprising the step of:

(a) subjecting a polyhydridosilane, which polyhydridosilane has a backbone consisting essentially of repeating monomeric units having the formula

where

R is the same or different and is independently selected from the group consisting of (1) hydrogen, (2) a linear, branched, or cyclic aliphatic group having 1 to 10 carbon atoms and optionally containing at least one Periodic Group VA or VIA atom, (3) an aromatic group which is unsubstituted or substituted by up to three $C_1$ to $C_{10}$ linear, branched, or cyclic aliphatic groups, said aromatic or aliphatic groups optionally containing at least one Periodic Group Va or VIA atom, the total number of carbon atoms being up to 25, (4) a single bond connecting two silicon atoms, (5) a metal atom selected from the group consisting of Periodic Groups IA and IIA, and (6) an inorgano- and organometallic group comprising at least one Periodic Group IB to, VIIB, VIII, Lanthanide or Actinide element,

with the proviso that

the ratio of hydride to silicon is in the range of 0.3 to 2.2 and the average number of monomeric units of said formula in the polymer is in the range of 9 to 4,000,

to pyrolysis over a temperature range of 200° to 2000° C. in a vacuum or an inert atmosphere and optionally in the presence of a nitrogen-containing compound to provide a pyropolymer having at least one group selected from silicon, silicon carbide, silicon nitride, and carbon.

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4,611,036

## EPOXY RESIN COMPOSITION

Hisashi Sekiguchi; Norio Kobayashi, both of Chiba, and Hideo Ohgishi, Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,648

Int. Cl.[4] C08G *59/20*

U.S. Cl. 525—481 16 Claims

1. An epoxy resin composition having excellent handling properties, solvent resistance and heat resistance and particularly excellent low-temperature curability, said composition comprising (A) a polyfunctional epoxy resin having an epoxy equivalent of 180 to 1,800 obtained by reacted (a-1) an epoxy resin having an epoxy equivalent of 160 to 700 and containing about 2 glycidyl ether groups derived from a diphenol compound with (a-2) a molecular weight increasing agent containing 2.1 to 10 on an average per molecule, and which is selected from the group consisting of novolak resins and modified phenolic resins, in such proportions that the number of phenolic hydroxyl group in the molecular weight increasing agent (a-2) is 0.05 to 0.8 per epoxy group in the epoxy resin (a-1) and (B) a curing agent for the epoxy resin as essential ingredients.

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4,611,037

## PROCESS FOR THE PRODUCTION OF POLYMERS HAVING REACTIVE END GROUPS

Rüdiger Musch, Bergisch Gladbach; Oskar Nuyken, Munich; Stephen D. Pask, Dormagen; Axel Vischer, Garching, and Michael Walter, Munich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 762,948

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430518

Int. Cl.[4] C08F *4/00*

U.S. Cl. 526—135 5 Claims

1. A process for the production of polymers having halogen end groups from cationically-polymerisable monomers, the monomer being polymerised in an inert solvent at a temperature of from +10° to −130° C. using a catalyst system consisting of a metal halide and an organic halide, characterised in that the organic halide corresponds to the following general formula:

wherein

X represents a halogen atom;

$R_1$, $R_2$, $R_3$ represents $C_5$–$C_{10}$ cycloalkyl, or a $C_1$–$C_{20}$ straight- or branched-chain alkyl or

wherein

$R_4$ and $R_5$ represent $C_5$–$C_{10}$ cycloalkyl or a $C_1$–$C_{20}$ straight- or branched-chain alkyl;

and that the organic halide has at least 5 carbon atoms and at most 50 carbon atoms and is in a concentration of from $10^{-1}$ to $10^{-6}$ mols per mol of monomer, and that $BX_3$, $SnX_4$, $TiX_4$, $SbX_5$ or $FeX_3$, wherein X denotes fluorine, chlorine, bromine or iodine, is used as the metal halide in from 2 to 500 times molar excess, based on the organic halide.

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4,611,038

## PROCESS FOR THE POLYMERIZATION OF OLEFINS

Claude Brun, Idron Bizanos; Auguste Cheux, Arthez, and Robert Pelletier, Billere, all of France, assignors to Atochem, Courbevoie, France

Division of Ser. No. 583,102, Feb. 23, 1984, Pat. No. 4,558,023. This application Jul. 18, 1985, Ser. No. 756,812

Claims priority, application France, Feb. 28, 1983, 83 03229

Int. Cl.[4] C08F *4/64, 4/62, 4/68*

U.S. Cl. 526—169.2 14 Claims

1. Process for the synthesis of an olefinic polymer or copolymer in which one or more olefins are polymerized in the presence of a catalyst system, which comprises contacting said olefins with said catalyst system and recovering said polymer or copolymer therefrom, said catalyst system consisting of an active solid hydrocarbon and having been prepared by forming a homogeneous pulverulent composition by combining (a) a component comprising a transition metal compound wherein said metal is chosen from Ti, V, Zr and Cr, in the form of particles having an average diameter of between 0.1 and 500 microns, (b) an inert porous organic or inorganic solid support in the form of a powder wherein said powder has a mean

particle diameter of from 1 to 5,000 microns, and (c) a liquid phase containing at least one compound chosen from the organometallic compound of the metals of group I to III of the Periodic Table of the Elements, the amounts of the component comprising the transition metal compound and of the organometallic compound or compounds being such that the ratio of the number of atoms of the metal or metals of groups I to III of the Periodic Table to the number of atoms of transition metal is between 0.1 and 800, while the amount of support powder is adjusted so that the mixture produced remains in pulverulent form, and polymerizing, in contact with the above pulverulent composition, one or more $C_2$ to $C_{12}$ olefins so that an active solid hydrocarbon containing an amount by weight of transition metal of between 10 and 50,000 ppm is produced, this polymerization being carried out in the gas phase at a temperature below the melting point of the active solid hydrocarbon, whilst an hourly conversion of the $C_2$ to $C_{12}$ olefin or olefins of less than 500,000 g per gram of transition metal is maintained.

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## 4,611,039
## WETTABLE, GAS PERMEABLE CONTACT LENS

**James C. Powell, Minnetonka, Minn., and G. Graham Allan, Seattle, Wash., assignors to Precision-Cosmet Co., Inc., Minnetonka, Minn.**

**Filed Nov. 9, 1981, Ser. No. 319,193**
**Int. Cl.[4] C08F *212/06, 212/08;* G02C *7/04***
**U.S. Cl. 526—271** **33 Claims**

1. A composition, having permeability to oxygen and carbon dioxide exchange, potential wettability, mechanical and dimensional stability when fabricated, which comprises a polymer comprising a major portion of styrene or a substituted styrene compound, an effective amount of an ethylenically unsaturated silicone-containing compound sufficient to provide oxygen and carbon dioxide exchange, an effective amount of an ethylenically polyunsaturated crosslinking compound, and an effective amount of an $\alpha$, $\beta$-ethylenically unsaturated dicarboxylic acid anhydride compound sufficient to provide wettability when hydrolyzed.

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## 4,611,040
## FLUORIDE ION AS A CURING CATALYST FOR SILICON-CONTAINING RESINS

**Kurt G. Olson, Gibsonia; William P. Blackburn, Evans City, and Mark E. Endlish, Chicora, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 5, 1985, Ser. No. 741,376**
**Int. Cl.[4] C08F *30/08***
**U.S. Cl. 526—279** **12 Claims**

1. A curable composition comprising:

(A) A silicon-containing resin having in one molecule at least one silicon atom connected to a hydrolyzable group and/or a hydroxyl group; and

(B) an effective amount of a cure promoting catalyst system for the silicon-containing resin, which catalyst system contains a compound containing an organic cation in combination with a fluoride ion.

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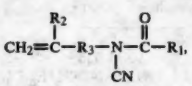
## 4,611,041
## POLYMERS DERIVED FROM N-CYANOACYLAMIDES

**Friedrich Stockinger, Hölstein; Friedrich Lohse, Oberwil, and Roland Moser, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Arsdley, N.Y.**

**Division of Ser. No. 466,458, Feb. 15, 1983, Pat. No. 4,529,821. This application Apr. 22, 1985, Ser. No. 725,866**
**Claims priority, application Switzerland, Feb. 23, 1982, 1104/82**
**Int. Cl.[4] C08F *20/42, 120/42, 220/42***
**U.S. Cl. 526—298** **6 Claims**

1. A linear homopolymer obtained by the thermal, free radical or ionic polymerization of an N-cyanoacylamide of formula I



(I)

in which $R_1$ is a hydrogen atom, alkyl having 1–20 C atoms, cycloalkyl having 5–8 C atoms or aryl having 6 or 10 ring C atoms, $R_2$ is a hydrogen atom or alkyl having 1–4 C atoms and $R_3$ is an alkylene or arylenealkylene group having not more than 12 C atoms, or, if $R_2$ is a hydrogen atom, $R_3$ is also an oxyalkylene group having not more than 12 C atoms.

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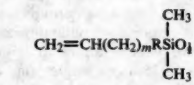
## 4,611,042
## RESINOUS COPOLYMERIC SILOXANES CONTAINING ALKENYLDIMETHYLSILOXANES

**Stacia A. Rivers-Farrell, Midland, and Antony P. Wright, Mills Township, Midland County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Oct. 3, 1985, Ser. No. 783,713**
**Int. Cl.[4] C08G *77/20***
**U.S. Cl. 528—32** **5 Claims**

1. A xylene-soluble copolymer consisting essentially of trimethylsiloxane units, alkenyldimethylsiloxane units, and $SiO_2$ units, the mole ratio of alkenyldimethylsiloxane units to trimethylsiloxane units being from 0.02:1 to 0.5:1, the mole ratio of the sum of trimethylsiloxane units and alkenyldimethylsiloxane units to $SiO_2$ units being from 0.6:1 to 1.2:1, and the silicon bonded hydroxyl content of the copolymer being no more than four weight percent, the alkenyldimethylsiloxane units are represented by the formula



wherein R denotes $-(CH_2)n-$ or $-CH{=}CH(CH_2)_p-$ and m has the value of 1, 2, or 3; n has the value of 3 or 6; and p has the value of 3, 4, or 5.

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## 4,611,043
## COATING COMPOSITION PREPARED BY REACTING AN ISOCYANATE PREPOLYMER WITH DICYCLOPENTENYL ALCOHOL

**Herman A. Bruson, deceased, late of Woodbridge, Conn., Virginia H. Bruson, executrix, and Kurt C. Frisch, Gross Ile, Mich., assignors to Virginia H. Bruson, Woodbridge, Conn.**

**Filed Jun. 22, 1983, Ser. No. 506,639**
**Int. Cl.[4] C08G *18/30***
**U.S. Cl. 528—49** **5 Claims**

1. A low cost resistant coating composition which comprises the reaction product of (I) an isocyanate terminated prepolymer which comprises the reaction product of at least one polyurethane-forming reagent containing a plurality of isocyanate groups and at least one polyhydric alcohol and (II) dicyclopentenyl alcohol.

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## 4,611,044
## POLYURETHANE CARPET BACKING CATALYZED WITH ORGANOIRON AND ORGANOBISMUTH CATALYSTS

**Louis W. Meyer; Linda M. McKinney, and Don H. Kelley, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed May 28, 1985, Ser. No. 737,984**
**Int. Cl.[4] C08G *18/14, 18/22***
**U.S. Cl. 528—56** **15 Claims**

1. In a process for preparing a polyurethane backed substrate whereby a reacting polyurethane forming mixture comprising

at least one polyahl and at least one polyisocyanate is applied to a substrate and subsequently cured thereon to form an attached polyurethane backing, the improvement which comprises employing an organoiron or organobismuth catalyst in said polyurethane forming mixture, said organoiron or organobismuth catalyst being employed in an amount such that said polyurethane forming mixture has a viscosity of not greater than 20,000 cps two minutes after the polyurethane forming mixture is contacted with said organoiron or organobismuth at 20°–50° C. and the polyurethane forming mixture reaches a tack free state in less than about 8 minutes upon curing at about 100°–150° C. in the presence of said organoiron or organobismuth catalyst.

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**4,611,045**

## MONOALKYLATION OF 1-ALKYL-DIAMINOBENZENES

**Kryn G. Ihrman, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.**

**Continuation of Ser. No. 427,139, Sep. 29, 1982, Pat. No. 4,440,952, which is a continuation-in-part of Ser. No. 403,289, Jul. 30, 1982, which is a continuation-in-part of Ser. No. 397,488, Jul. 12, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,752**

**Int. Cl.⁴ C08G *18/32***

**U.S. Cl. 528—76** **1 Claim**

1. A polyurethane formed by reacting an organic polyol, an organic polyisocyanate, and a chain extender comprising the compound 1-methyl-2,6-diamino-3-isopropylbenzene in the presence of a catalyst for the reaction of the polyisocyanate and the polyol.

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**4,611,046**

## HYDROXYL TERMINATED AZOMETHINES AND HIGH GLASS TRANSITION TEMPERATURE POLYETHER PRODUCTS PRODUCED THEREFROM

**Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Division of Ser. No. 711,881, Mar. 15, 1985. This application Dec. 9, 1985, Ser. No. 806,897**

**Int. Cl.⁴ C08G *59/62***

**U.S. Cl. 528—98** **9 Claims**

1. Polyether products having high glass temperatures and being produced by reacting:

I. epoxy resin, and

II. hydroxyl terminated aromatic azomethines formed by reacting:

(A′) diamine compounds having the formula:

$$H_2N—Y'—NH_2,$$

wherein Y′ is a pyridine group or an arylene moiety containing one or two phenylene rings and the $NH_2$ groups are linked through Y′ at the 1,3 or 1,4 positions; and

(B′) aromatic compounds having the formula:

$$OR'C—X'—OH,$$

wherein X′ is a phenyl group, R′ is H or an alkyl group having 1–5 carbon atoms, and the CR′O group and OH groups are linked through X′ at the 1,3 or 1,4 positions,

said compounds (A′) and (B′) being reacted in about a 1:2 molar ratio and under conditions wherein said $NH_2$ group of (A′) and said CR′O group of (B′) react.

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**4,611,047**

## DICARBOXYLIC ACID AZOMETHINES AND HIGH GLASS TRANSITION TEMPERATURE POLYESTER PRODUCTS PRODUCED THEREFROM

**Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborne, Mich.**

**Division of Ser. No. 712,055, Mar. 15, 1985, Pat. No. 4,595,761. This application Dec. 20, 1985, Ser. No. 811,861**

**Int. Cl.⁴ C08G *59/52***

**U.S. Cl. 528—114** **9 Claims**

1. Polyester products having high glass temperatures and being formed by reacting:

I. epoxy resin, and

II. carboxy terminated aromatic azomethines formed by reacting:

(A) aromatic compounds having the formula:

$$ORC\text{-}X\text{-}CRO,$$

wherein X is a phenyl group, each R is H or an alkyl group having 1–5 carbon atoms, and the CRO groups are linked through X at the 1,3 or 1,4 positions; and

(B) compounds having the formula

$$H_2N\text{-}Y\text{-}(R')_n\text{-}COOH:$$

wherein Y is a phenyl or pyridine group, n is O or 1, R′ is an organic group, and the $H_2N$ and COOH groups are linked through Y at the 1,3 or 1,4 positions,

said compounds (A) and (B) being reacted in about a 1:2 molar ratio and under conditions wherein said CRO groups of (A) and said $NH_2$ group of (B) react.

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**4,611,048**

## HYDROXY TERMINATED POLYETHERIMIDE OLIGOMERS

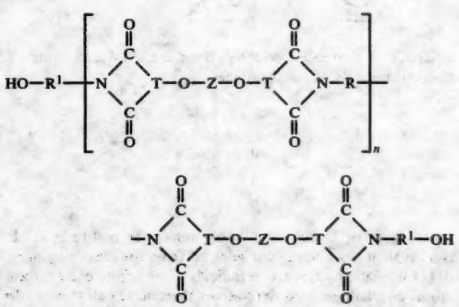
**Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Oct. 4, 1985, Ser. No. 784,362**

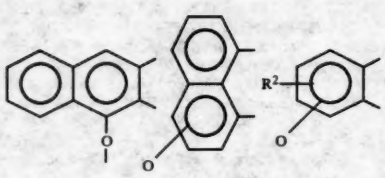
**Int. Cl.⁴ C08G *73/10***

**U.S. Cl. 528—185** **15 Claims**

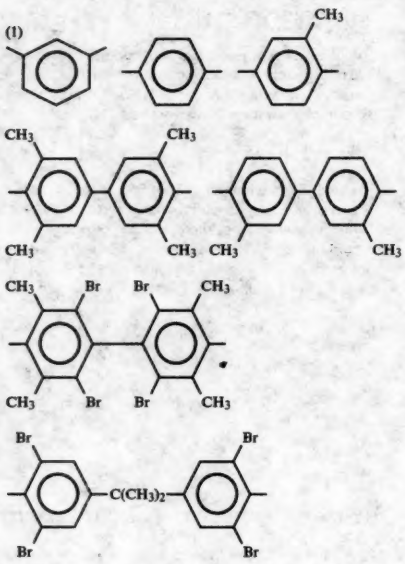
1. A hydroxy terminated polyetherimide oligomer of the formula:



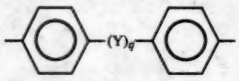
wherein n is an integer of from about 1 to about 12; and —O—T< group is selected from the class consisting of:



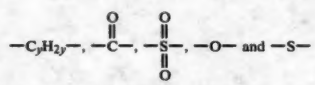
$R^2$ being hydrogen, lower alkyl or lower alkoxy; and Z is a member of the class consisting of:



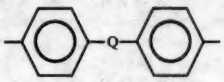
and (2) divalent organic radicals of the general formula:



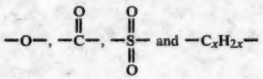
where Y is a member selected from the class consisting of divalent radicals of the formulae:



where q is 0 or 1, and y is a whole number from 1 to 5; and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganoloxane, and (3) divalent radicals included by the formula:



where Q is a member selected from the class consisting of:



where x is a whole number from 1 to 5 inclusive; and $R^1$ is as defined for R above.

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**4,611,049**

## PROCESS FOR PRODUCING AROMATIC POLYESTER

**Taketoshi Kuratsuji, Matsuyama, and Tetsuro Miki, Hino, both of Japan, assignors to Teijin Limited, Osaka, Japan**

**Division of Ser. No. 618,255, Jun. 7, 1984, abandoned. This application Apr. 25, 1985, Ser. No. 727,088**

**Int. Cl.[4] C08G *63/34***

**U.S. Cl. 528—279** **13 Claims**

1. A process for producing an aromatic polyester having an aromatic dicarboxylic acid as a main acid component and trimethylene glycol or tetramethylene glycol as a main glycol component from a starting material composed mainly of an aromatic dicarboxylic acid or its polyester forming functional derivative and trimethylene glycol or tetramethylene glycol; wherein at least one organometallic catalyst selected from the group consisting of organotitanium compounds and organotin compounds and from about 0.1 to about 10 moles, per mole of the organometallic catalyst, of at least one promoter which is an aliphatic carboxylic acid or a metal salt thereof, an anhydride thereof, an ester thereof or an acid halide thereof, and being capable of increasing the catalyst activity of the organometallic catalyst are added to the reaction system so that the promoter increases the catalytic activity of the organometallic catalyst, and an aromatic polyester having an increased degree of polymerization is formed at an increased rate of polymerization.

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**4,611,050**

## ESSENTIALLY LINEAR POLYMER HAVING A PLURALITY OF AMIDE, IMIDE AND ESTER GROUPS THEREIN, AND A METHOD OF MAKING THE SAME

**Donald J. Barta, Ossian, and George H. Sollner, New Haven, both of Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.**

**Division of Ser. No. 481,756, Apr. 4, 1983. This application Mar. 18, 1985, Ser. No. 713,282**

**Int. Cl.[4] C08G *69/44, 73/16***

**U.S. Cl. 528—289** **19 Claims**

1. An essentially linear resin having a plurality of amide, imide and ester groups therein comprising the condensation product of at least one polycarboxylic acid five member ring forming reactant, at least one ethylenically unsaturated polycarboxylic acid five or six member lactam ring forming reactant, at least one difunctional amino five or six member ring forming reactant, at least one polyfunctional hydroxyl compound, at least one polycarxboyxlic acid reactant having no more than two carboxylic acid ester forming radicals, and at least one polycarboxylic acid reactant having two or more carboxylic acid ester forming radicals with at least two of the radicals in the 1,2 position relative to each other, the bonds of said condensation product when cured on a substrate being in part thermolabile in a molten solder bath, thereby having all of the physical, mechanical, chemical and electrical properties of a tinnable and solderable magnet wire insulation material.

4,611,051

## NOVEL POLY(ESTER-AMIDE) HOT-MELT ADHESIVES

Kathryn S. Hayes, Norristown, Pa.; Charles R. Frihart, Lawrenceville, N.J., and Ronald J. Wroczynski, Pittsfield, Mass., assignors to Union Camp Corporation, Wayne, N.J.

Filed Dec. 31, 1985, Ser. No. 815,340
Int. Cl.[4] C08G *63/54, 63/48, 63/44, 69/44*
U.S. Cl. 528—295.3 4 Claims

1. A poly(ester-amide) adhesive composition which comprises the product of the polymerization of:

(a) from about 95 to about 40 equivalent percent of a polymeric fatty acid and from about 5 to about 60 equivalent percent of eicosanedioic acid (1,18-octadecanedicarboxylic acid); and

(b) a substantially equivalent amount of from about 30 to about 90 equivalent percent of an organic diamine and from about 70 to about 10 equivalent percent of an organic diol.

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4,611,052

## PROCESS FOR THE PREPARATION OF A NYLON BLOCK COPOLYMER WITH MIXTURE OF HIGH MOLECULAR WEIGHT ACTIVATOR REACTANT AND LOW MOLECULAR WEIGHT ACTIVATOR REACTANT

Cornelis H. Vrinssen, Geleen; Albert A. van Gennen, Brunssum, and Jozef J. M. Bongers, Elsloo, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 24, 1985, Ser. No. 694,624
Claims priority, application Netherlands, Feb. 9, 1984, 8400411
Int. Cl.[4] C08G *69/20*
U.S. Cl. 528—312 13 Claims

1. Process for preparing a nylon block copolymer composition comprising:

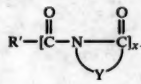
polymerizing at least one lactam in the presence of a lactam-polymerization catalyst and a reactant activator, wherein the reactant activator comprises:

(a) a high molecular weight lactam-terminated activator having a molecular weight of at least 1500, said high molecular weight lactam-terminated activator obtained by reacting a polyol with a low molecular weight lactam-terminated activator; and

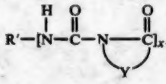
(b) a low molecular weight lactam-terminated activator, said low molecular weight lactam-terminated activator having a molecular weight of at most 750 wherein said low molecular weight lactam-terminated activator is a lactam-terminated polyisocyanate or polyacyl-lactam compound,

wherein said process:

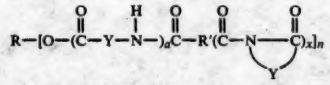
said polyacyl lactam activator has the following formula:



said lactam terminated polyisocyanate has the following formula:

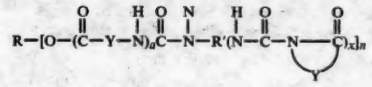


said high molecular weight activator is:



or:

-continued



wherein the above formulas:

R′ is the organic residue of a polyisocyanate or a polyacyl compound,

R is the organic residue of a polyol,

a is a value between 0 and 1,

n is greater than or equal to 2,

x+1 equals the functionality of the low molecular weight activator compound, and

Y is the residue of the lactam ring of the said activator compounds.

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4,611,053

## POLYHYDROXAMIDE POLYMER

Michiyuki (Mitch) Sasa, 166-5 Evergreen Ter., Carbondale, Ill. 62901

Filed Feb. 15, 1985, Ser. No. 702,082
Int. Cl.[4] C08G *69/00, 69/26*
U.S. Cl. 528—335 7 Claims

1. A polymer containing at least 10 recurrent

groups connected by substituted or unsubstituted divalent linking radicals.

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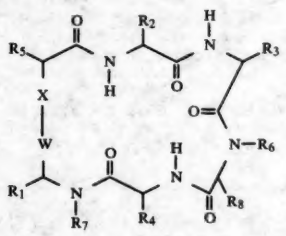
4,611,054

## CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

Roger Freidinger, Hatfield, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 29, 1985, Ser. No. 728,353
Int. Cl.[4] C07K *7/26;* A61K *37/24*
U.S. Cl. 530—311 13 Claims

1. A compound having the formula:



wherein

$R_1$ and $R_2$ are independtly lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5- or 6-membered heterocyclic ring;

$R_3$ is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;

$R_4$ is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro;

$R_5$ is hydrogen, loweralkyl, benzyl or substituted benzyl

wherein the substituent is loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro;

$R_6$ and $R_7$ are independently hydrogen or methyl;

$R_8$ is aminocyclohexylmethyl, aminomethylbenzyl or

wherein

Y is $(CH_2)_m$ and m is 0, 1 or 2 or sulfur such that the sulfur may be in any position along the chain; and

the peptide surrogate linkage W—X is —$CH_2$—S—, —$CH_2$—S—(O)—, —$CH_2$—$SO_2$—, $CH_2$—NH—, —$CH_2$—O—, —S—$CH_2$—, —$CH_2$—CH(OH)—, —$CH_2$—$CH_2$, or —$CH_2$—CO.

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**4,611,055**

## PRODUCTION OF SUCROSE FATTY ACID POLYESTER

**Toshiaki Yamamoto, Ohtsu, and Kenichi Kinami, Kyoto, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan**

**Filed Jun. 26, 1985, Ser. No. 748,793**

**Claims priority, application Japan, Jun. 29, 1984, 59-136383**

**Int. Cl.[4] C07H *13/06***

**U.S. Cl. 536—119** **19 Claims**

1. In a process for producing sucrose fatty acid polyester by microemulsion or solvent-free transesterification of sucrose, the improvement which comprises the steps of (a) heating a molten mixture of sucrose, at least 4 moles per mole of sucrose of a fatty acid lower alkyl ester, a basic transesterification catalyst, a fatty acid alkali metal soap and/or a sucrose fatty acid ester at a temperature from 120° C. to 180° C. under a vacuum less than 10 mmHg with stirring at a linear speed of 1.0 to 50 m/second, (b) acidifying the reaction product with an acid to a pH below 6, (c) subjecting the acidified reaction product to molecular distillation, and (d) recovering the sucrose fatty acid polyester from the residue in a purified form.

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**4,611,056**

## BENZO[A]PHENOTHIAZINES AND HYDRO-DERIVATIVES

**Yvan Guindon, Closse Ile Bizard; Yves Girard; Cheuk K. Lau, both of Pierrefonds; Rejean Fortin, Montreal; Joshua Rokach, Laval, and Christiane Yoakim, Montreal, all of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada**

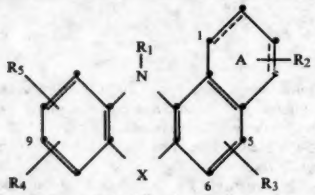
**Continuation-in-part of Ser. No. 654,994, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 539,215, Oct. 5, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 716,878**

**Int. Cl.[4] C07D *265/38, 279/20, 279/30***

**U.S. Cl. 544—31** **11 Claims**

1. A compound having the Formula:

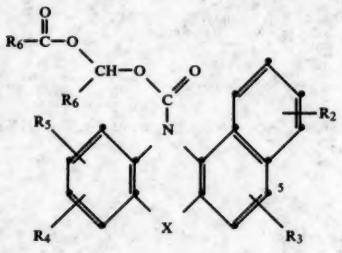
(I)



and one of the following substituent patterns:

| X | Ring A | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ |
|---|---|---|---|---|---|---|
| S | aromatic | H | 5-OCOCH$_3$ | H | H | H |
| S | aromatic | CH$_3$ | 5-OCH$_3$ | H | H | H |
| S | aromatic | CH$_3$ | 5-OCOCH$_3$ | H | H | H |
| S | aromatic | H | 5-OCOCH$_2$NH$_2$ | H | H | H |
| S | aromatic | H | 5-OCOCH(CH$_3$)$_2$ | H | H | H |
| S | aromatic | H | 5-OCOC(CH$_3$)$_3$ | H | H | H |
| S | aromatic | H | 5-OCOC$_6$H$_5$ | H | H | H |
| S | aromatic | H | 5-OCOCH$_3$ | 6-CH$_3$ | H | H |
| S | aromatic | H | 5-OH | 1-OH | 6-CH$_3$ | H |
| S | aromatic | H | 5-OCOCH$_3$ | 1-OH | 6-CH$_3$ | H |
| S | aromatic | H | 5-OH | 1-OCH$_3$ | 6-CH$_3$ | H |
| S | aromatic | H | 5-OCOCH$_3$ | 1-OCH$_3$ | 6-CH$_3$ | H |
| S | aromatic | H | 5-OCOC(CH$_3$)$_3$ | 1-OCH$_3$ | 6-CH$_3$ | H |
| S | 1,4-dihydro | H | 5-OCOCH$_3$ | H | H | H |
| S | aromatic | H | 5-OCOCH$_3$ | H | H | H |
| SO$_2$ | aromatic | H | 5-OCOCH$_3$ | H | H | H |
| SO | aromatic | H | 5-OH | H | H | H |
| SO$_2$ | aromatic | H | 5-OH | H | H | H |
| S | aromatic | H | 5-OCH$_3$ | H | H | H |
| S | aromatic | COCH$_3$ | 5-OCOCH$_3$ | H | H | H |
| S | aromatic | CH$_3$ | 5-OH | H | H | H |
| S | aromatic | $CO_2CHCH_3$ (OAc) | 5-OH | H | H | H |
| S | aromatic | $CO_2CHCH_3$ (OAc) | 5-OAc | H | H | H |
| S | aromatic | $CO_2CHCH_3$ (OAc) | 5-$OCO_2CHCH_3$ (OAc) | H | H | H |
| S | aromatic | H | 5-$OCO_2CHCH_3$ (OAc) | H | H | H |
| S | aromatic | H | 5-OPO(OEt)$_2$ | H | H | H |
| S | aromatic | H | 5-OH | 9-OMe | H | H |
| S | aromatic | H | 5-OAc | 9-OMe | H | H |
| S | aromatic | H | 5-OAc | 9-Me | H | H |
| S | aromatic | H | 5-OH | 9-F | H | H |
| S | aromatic | H | 5-OAc | 9-F | H | H |
| S | aromatic | H | 5-OH | 6-OAc | H | H |
| S | aromatic | H | 5-OAc | 6-OAc | H | H |
| S | aromatic | Ac | 5-OH | 6-OH | H | H |
| S | aromatic | Ac | 5-OAc | 6-OAc | H | H |
| O | aromatic | H | 5-OH | H | H | H |
| O | aromatic | H | 5-OAc | H | H | H |
| O | aromatic | OAc $CO_2CHCH_3$ | 5-OH | H | H | H |
| SO$_2$ | aromatic | OAc $CO_2CHCH_3$ | 5-OH | H | H | H |
| S | aromatic | $OCOC(CH_3)_3$ $CO_2CHCH_3$ | 5-OH | H | H | H |
| S | aromatic | $CO_2C_2H_5$ | 5-OH | H | H | H |
| S | aromatic | $CO_2CH(CH_3)_2$ | 5-OH | H | H | H |
| S | aromatic | OAc $CHCH_3$ | 5-OH | H | H | H |
| S | aromatic | $OCOC(CH_3)_3$ $CHCH_3$ | 5-OH | H | H | H |
| S | aromatic | OAc $CO_2CHCH_3$ | 5-OH | 6-Cl | H | H |
| S | aromatic | OAc $CO_2CHCH_3$ | 5-OH | 6-CF$_3$ | H | H |
| S | aromatic | OAc $CO_2CHCH_3$ | 5-OH | 6-F | H | H |

**10.** A compound of the formula:

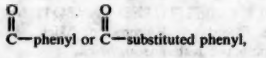


(IIIa)

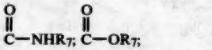
wherein

X is O, S, SO or $SO_2$;

$R_1$ is H; $C_1$-to-$C_6$-alkyl; $C_1$-to-$C_6$-acyl; $C_1$-to-$C_6$-aminoacyl; $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkyl; $C_1$-to-$C_6$-alkoxy-$C_1$-to-$C_6$-alkoxy;



wherein the substituents of substituted phenyl are as defined below among the definitions of $R_{15}$; carbamoyl;



$SO_2$-$C_6H_4$-p-$CH_3$; $SO_2CH_3$; or $R_1$ is an acyl group, such that $R_1$-OH is an essential amino acid;

$R_2$, $R_3$, $R_4$ and $R_5$, all of which may be positioned anywhere on the structure, are independently selected from:

(1) hydrogen;

(2) alkyl having 1-to-6 carbon atoms;

(3) alkenyl having 2-to-6 carbon atoms;

(4) $-(CH_2)_nM$, wherein n is 0 to 6 and M is

(a) $OR_{15}$, where $R_{15}$ is as defined below;

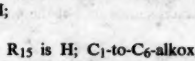
(b) F, Cl, Br or I;

(c) $CF_3$;

(d) $SR_{15}$ where $R_{15}$ is H; $C_1$-to-$C_6$-alkoxy-$C_1$-to-$C_6$-alkyl; $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkyl; $C_1$-to-$C_6$-alkyl; benzyl; $-(CH_2)_nCOOR_6$, wherein n is 0 to 6; CN; formyl; $C_1$-to-$C_4$-perfluoroalkyl; $CH_2$-$R_{12}$, wherein $R_{12}$ is $C_1$-to-$C_5$-alkyldimethylamino or phenyl; phenyl; substituted phenyl, wherein the substituents are $C_1$-to-$C_3$-alkyl, Cl, F, Br, I, CN, $CF_3$, $COOR_6$, $CH_2COOR_6$, $(CH_2)_pNR_8R_9$ where p is 0 to 2, $C_1$-to-$C_3$-alkoxy or OH;

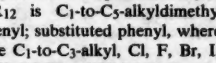
(e) phenyl or substituted phenyl, wherein substituted phenyl is as defined in the definition of $R_{15}$;

(f) $COOR_6$;



(g)

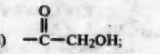
(h) tetrazole;



(i)

(j) $-NR_8R_9$;

(k) $-NHSO_2R_{10}$ wherein $R_{10}$ is OH, $C_1$-to-$C_6$-alkyl, $C_1$-to-$C_6$-alkoxy, or phenyl;



(l)

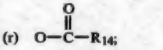
(m) $-SOR_{11}$, wherein $R_{11}$ is $C_1$-to-$C_6$-alkyl; phenyl; substituted phenyl, where substituted phenyl is as defined in the definition of $R_{15}$; $(CH_2)_mCOOR_6$, wherein m is 1 to 6; CN; formyl or perfluoro-$C_1$-to-$C_4$-alkyl;

(n) $-CONR_8R_9$;

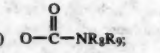
(o) $-SO_2NR_8R_9$;

(p) $-SO_2R_{13}$, wherein $R_{13}$ is OH; $C_1$-to-$C_6$-alkyl; H; phenyl; substituted phenyl, wherein substituted phenyl is as defined in the definition of $R_{15}$; $(CH_2)_mCOOR_6$, wherein m is 1 to 6; CN; formyl or perfluoro-$C_1$-to-$C_4$-alkyl;

(q) $NO_2$;



(r)

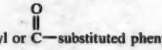


(s)

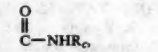
(t) —CN;

(u) $-OPO(OR_6)_2$; or

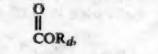
(v) $-OR_a$, wherein $R_a$ is H; $C_1$-to-$C_5$-alkyl; $C_1$-to-$C_5$-acyl; $C_1$-to-$C_6$-alkoxy-$C_1$-to-$C_6$-alkyl; $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkyl; $C_1$-to-$C_4$-aminoacyl; carbamoyl;



wherein substituted phenyl is as defined in the definition of $R_{15}$;



where $R_c$ is $C_1$-to-$C_4$-alkyl;



where $R_d$ is $C_1$-to-$C_4$-alkyl or $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkyl; or is a structure such that $-OR_a$ is an ester of an essential amino acid; and

(5) $-(CHR_6)_qCOOR_6$, where q is 0 to 4;

where each $R_6$ is independently H, phenyl or $C_1$-to-$C_6$-alkyl;

each $R^7$ is $C_1$-to-$C_6$-alkyl, benzyl, phenyl or $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkyl;

each $R_8$ and each $R_9$ is independently H, phenyl or substituted phenyl, where substituted phenyl is as defined in the definition of $R_{15}$, or $C_1$-to-$C_4$-alkyl, or an $R_8$ and an $R_9$ may be joined through the N to form a heterocycloalkyl of 5-to-8 ring atoms;

each $R_{14}$ is independently H, $(CH_2)_qCOOR_6$ wherein q is 0 to 4, $C_1$-to-$C_6$-alkyl, $C_1$-to-$C_6$-alkoxy, $C_1$-to-$C_6$-acyloxy-$C_1$-to-$C_6$-alkoxy, phenyl or substituted phenyl wherein substituted phenyl is as defined in the definition of $R_{15}$, $C_1$-to-$C_6$-aminoalkyl, or $R_{14}$ is such that $R_{14}CO_2H$ is an essential amino acid; and pharmaceutically-acceptable salts thereof.

## 4,611,057
## PROCESS FOR PREPARING PYRIMIDINETRIONE DERIVATIVES

**Philippe Gold-Aubert; Diran Melkonian; Jindrich Vachta; Karel Valter, all of Geneva, Switzerland; Bernard Siegfried, Douvaine, France, and Stéphane Hugentobler, Geneva, Switzerland, assignors to Sapos S.A., Geneve, Switzerland**

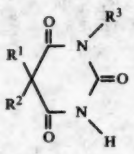
**Filed Apr. 11, 1984, Ser. No. 598,969**

**Claims priority, application United Kingdom, Apr. 12, 1983, 8309813**

**Int. Cl.[4] C07D** *239/62*

**U.S. Cl. 544—301** **18 Claims**

1. A process for the preparation of a compound of formula (I)



(I)

wherein $R^1$ and $R^2$, which may be the same or different, represent aliphatic, araliphatic or aryl groups, and $R^3$ represents a group of the formula $—CH_2CH(OCONH_2)\ CH_2OX$ wherein X is hydrogen or a $C_{1-5}$ alkyl group which comprises reacting approximately equimolar amounts of a monoalkali metal salt of a compound of formula (I) wherein $R^3$ is a hydrogen atom, with an alkylating agent $R^3Hal$ wherein $R^3$ is as defined above and Hal represents a halogen atom, in the presence of at least 0.2 moles of an acid of formula (I) wherein $R^3$ is a hydrogen atom per mole of alkali metal salt.

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## 4,611,058
## PROCESS FOR THE PREPARATION OF 1,5-DIDESOXY-1,5-IMINO-D-GLUCITOL AND N-DERIVATIVES THEREOF

**Wolfgang Koebernick, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

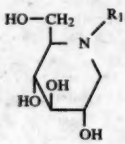
**Continuation of Ser. No. 558,669, Dec. 6, 1983, abandoned, which is a continuation of Ser. No. 331,335, Dec. 16, 1981, abandoned. This application May 14, 1985, Ser. No. 734,362**

**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049446**

**Int. Cl.[4] C07D** *211/46*

**U.S. Cl. 546—242** **9 Claims**

1. A process for the production of 1,5-didesoxy-1,5-imino-D-glucitol or an N-derivative of the formula

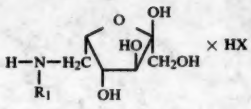


(I)

in which

$R_1$ denotes a hydrogen atom or an optionally substituted akyl, alkenyl, alkinyl or alkadienyl radical, or an acid addition salt thereof with the acid HX,

which comprises reducing with dimethylamino borane, optionally in the presence of an auxiliary base, a compound of the formula



(II)

wherein

$R_1$ has the abovementioned meaning mentioned, and HX is a strong acid.

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## 4,611,059
## PYRIDYL-SUBSTITUTED BENZOTHIOPHENES

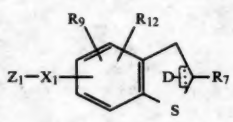
**John C. Sih, County of Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation of Ser. No. 433,938, Oct. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 385,621, Jun. 8, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,597**

**Int. Cl.[4] C07D** *409/06, 409/12, 495/04*

**U.S. Cl. 546—274** **5 Claims**

1. A compound of the formula I



I

wherein $Z_1$ is

(a) 4-pyridinyl,

(b) 3-pyridinyl, or

(c) 3-pyridinyl substituted at the 4 position by

(1) methyl,

(2) $—OCH_3$,

(3) $—N(CH_3)_2$, or

(4) $—NH_2$, or

(d) 3-pyridinyl substituted at the 2, 4, 5, or 6 position by chlorine; wherein $X_1$ is

(a) $—(CH_2)_n—$,

(b) —C(OH)—, or

(c) —C(O)—;

wherein $R_7$ is

(a) hydrogen,

(b) $—CH_2OH$, or

wherein $R_9$ and $R_{12}$ are the same or different and are

(a) hydrogen,

(b) $(C_1–C_4)$alkyl,

(c) fluoro,

(d) chloro,

(e) bromo,

(f) $—OCH_3$, or,

(g) when taken together and attached to contiguous carbon atoms, —O— $CH_2$—O—;

wherein D represents a single or a double bond; and

wherein n is 1; including pharmacologically acceptable acid addition salts thereof; and

when D represents a single bond, an enantiomer or a racemic mixture of enantiomers thereof; with the proviso that $X_1$ is $—(CH_2)_n—$ only when $R_7$ is hydrogen.

## 4,611,060
## INTERMEDIATE(1,3-BENZOTHIAZOL-2H-YI OR 1,3-BENZOXAZOL-2H-YI)4-OXY-OR 4-THIO-PHENYLUREA DERIVATIVES

Axel Haberkorn, Wuppertal; Heinrich Kölling, Haan, both of Fed. Rep. of Germany; Toyohiko Kume, and Shinpei Kuyama, both of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

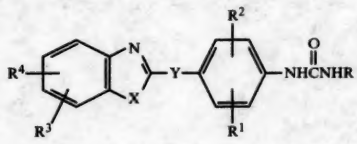
Division of Ser. No. 700,366, Feb. 11, 1985, Pat. No. 4,568,674. This application Oct. 4, 1985, Ser. No. 784,402

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405241

Int. Cl.[4] C07D *277/74, 277/68, 263/58*

U.S. Cl. 548—171 1 Claim

1. A compound of the formula



(II)

in which

R is lower alkyl,

$R^1$ and $R^2$ each independently is hydrogen, halogen, alkyl or alkoxy,

$R^3$ and $R^4$ each independently is hydrogen, halogen, alkyl, alkoxy, alkylthio, fluoroalkyl, fluoroalkoxy or fluoroalkylthio, and

X and Y each independently is sulphur or oxygen.

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## 4,611,061
## 2'-HYDROXY-5'-(HYDROXYALKYL)PHENYL-2H-BENZOTRIAZOLES

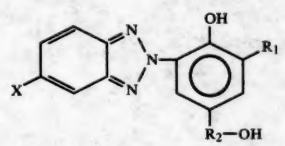
Charles D. Beard, Sierra Madre; Namassivaya Doddi, Upland, both of Calif., and Akira Yamada, Kyoto, Japan, assignors to Iolab Corporation, Covina, Calif.

Filed Mar. 26, 1984, Ser. No. 592,764

Int. Cl.[4] C07D *249/18*

U.S. Cl. 548—260 6 Claims

1. A compound of the formula



wherein

X is halogen or —$OCH_3$;

$R_1$ is selected from the group consisting of $CH_3$, and n-, sec- and t-alkyl of 4 to 6 carbons; and

$R_2$ is a $C_n$ alkylene which may be straight chain or branched wherein n is from 2 to 10.

## 4,611,062
## PROCESS FOR RESOLVING CERTAIN SPIRO COMPOUNDS

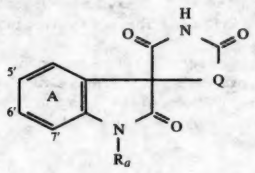
Geoffrey R. Bedford, Congleton; David R. Brittain, Rochdale, and Ronald Platt, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 593,312, Mar. 26, 1984, Pat. No. 4,567,278. This application Oct. 22, 1985, Ser. No. 790,224

Int. Cl.[4] C07D *487/10*

U.S. Cl. 548—309 1 Claim

1. An improved process for the manufacture of an enantiomeric form of a compound of formula I



wherein $R_a$ is (2–12C)alkyl, or naphthylmethyl or cinnamyl optionally bearing one or two halogeno substituents, or benzyl optionally bearing one or two substituents independently selected from halogen, (1–4C)alkyl, (1–4C)alkoxy, cyano, nitro and trifluoromethyl located in the 2-, 3-, 4- or 5-position of the phenyl moiety; benzene ring A optionally bears one or two substituents independently selected from halogeno, (1–4C)alkyl, trifluoromethyl and nitro; and Q is methylene or imino; but $R_a$ is other than ethyl, n-propyl or unsubstituted benzyl when benzene ring A is unsubstituted and Q is imino; which comprises carrying out the known steps of:

(a) forming a diastereoisomeric mixture of salts between a racemic form of said compound and an optically active form of a suitable quaternary ammonium base;

(b) separating the mixture of salts obtained in (a) by fractional crystallisation from a suitable solvent to give a crystalline salt and a mother liquor; and

(c) liberating said required enantiomeric form of the compound of formula I from the crystalline salt obtained in (b) by acidification; and is characterised by carrying out the additional steps of:

(d) liberating the mixture of enantiomeric forms of the compound of formula I by acidification of the salts in the mother liquor obtained in (b);

(e) heating the mixture of enantiomeric forms of the compound of formula I obtained in (d) at a temperature in the range 80° to 280° C., to give the racemic form of said compound; and

(f) recycling the racemic form obtained in (e) in the salt formation step (a).

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## 4,611,063
## SILICON-BEARING AMIDES

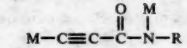
Robert E. Damon, II, Randolph, N.J., assignor to Sandoz Corp., Hanover, N.J.

Division of Ser. No. 215,414, Dec. 11, 1980, which is a continuation-in-part of Ser. No. 80,424, Oct. 1, 1979, Pat. No. 4,420,475, which is a continuation-in-part of Ser. No. 74,002, Sep. 10, 1979, abandoned. This application Aug. 25, 1983, Ser. No. 526,471

Int. Cl.[4] C07F *7/10, 7/02;* C07C *103/58;* C07D *207/30*

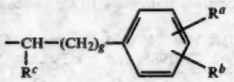
U.S. Cl. 548—406 20 Claims

1. A dianion of the formula



in which R is of type (a) and aralkyl-type radical of the structure

(a)



wherein

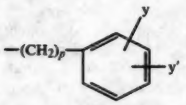
g is 0, 1 or 2;

$R^a$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

$R^b$ is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms or halo having an atomic weight of from about 19 to 36; and

$R^c$ is subtype (i) a hydrogen atom; subtype (ii), a radical of the structure

(ii)



in which

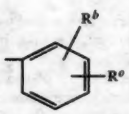
p is 0, 1 or 2, and

y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or subtype (iii) alkyl having from 1 to 8 carbon atoms;

R is of type (b) a phenyl-type radical of the structure

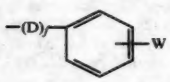
(b)



in which

$R^b$ is as defined above, and

$R^o$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or $R^o$ is a radical of the structure R/:



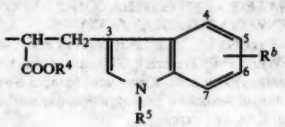
in which

D is $-CH_2-$ or $-O-$;

f is 0 or 1; and

W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or

R is of type (c) an indolyl radical of the structure: (c)



wherein

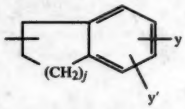
$R^b$ is as defined above;

$R^4$ is hydrogen; an equivalent of a cation which results in the formation of a salt which is pharmaceutically acceptable; alkyl having from 1 to 8 carbon atoms; or benzyl;

$R^5$ is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or

R is (d) a benzocycloalkyl nucleus of the structure:

(d)



wherein

y and y′ are as defined above; and

j is a whole integer of from 1 to 4; and each M is an equivalent of an alkali metal or a magnesium chloride or bromide.

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**4,611,064**

## PREPARATION OF INDOLE DERIVATIVES

**Ernst Schefczik, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany**

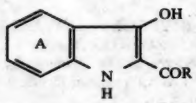
**Filed Oct. 17, 1985, Ser. No. 788,575**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438218**

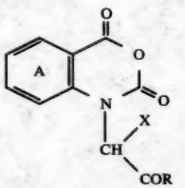
**Int. Cl.[4] C07D** *209/36, 209/42*

**U.S. Cl. 548—484** **3 Claims**

1. A process for the preparation of a compound which, in one of the possible tautomeric forms and as a free acidic compouno, is of the formula I



where R is unsubstituted or substituted alkyl, alkoxy, cycloalkoxy or aryloxy, and the ring A may be further substituted, wherein a compound of the formula II



where X is hydrogen or an alkoxycarbonyl group and R has the above meanings with the exception of unsubstituted or substituted alkyl, is converted in an alcoholate-containing solution and the product then acidified.

## 4,611,065
## METHOD FOR PREPARING 5-FLUOROPROSTACYCLINS

**Robert B. Garland, Northbrook, Ill., assignor to G. D. Searle & Co., Skokie, Ill.**

**Filed Jan. 25, 1985, Ser. No. 695,146**
**Int. Cl.[4] C07D *307/935***
**U.S. Cl. 549—214** **9 Claims**

1. A process for preparing 11α,15S-bis[(1,1-dimethylethyl)-diphenylsilyloxy]-6,9α-epoxyprosta-5S-fluoro-6S-methoxy-13E-en-1-oate esters wherein

(a) an 11α,15S-bis[1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5S-fluoro-6R-methoxy-13E-en-1-oate ester is treated with a mild acid in methanol to give an 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5S-fluoro-6(R and S)-methoxy-13E-en-1-oate ester mixture, and

(b) the resultant ester mixture is separated to give 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5S-fluoro-6S-methoxy-13E-en-1-oate ester.

6. A process for preparing 11α,15S-bis[(1,1-dimethylethyl)-diphenylsilyloxy]-6,9α-epoxyprosta-5R-fluoro-6,13E-dien-1-oate esters and 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5-fluoro-5E,13E-dien-1-oate esters wherein

(a) an 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5R-fluoro-6,13E-dien-1-oate ester is treated with a mild acid in methanol,

(b) the acidified solution is quenched with a base and concentrated,

(c) the quenched mixture is extracted and concentrated to give an 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5R-fluoro-6(R and S)-methoxy-13E-en-1-oate ester mixture, and

(d) the ester mixture is reacted with magnesium triflate and picoline to form 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5R-fluoro-6,13E-dien-1-oate and 11α,15S-bis[(1,1-dimethylethyl)diphenylsilyloxy]-6,9α-epoxyprosta-5-fluoro-5E,13E-dien-1-oate esters.

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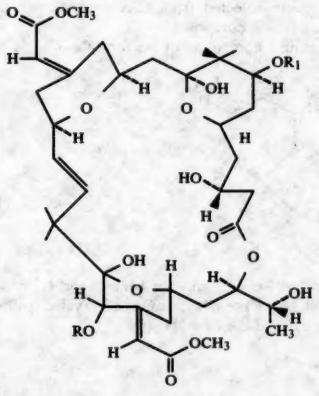
## 4,611,066
## BRYOSTATINS 4 TO 8

**George R. Pettit, Paradise Valley; Cherry L. Herald, and Yoskiaki Kamano, both of Tempe, all of Ariz., assignors to Arizona State University, Tempe, Ariz.**

**Filed Aug. 10, 1984, Ser. No. 639,898**
**Int. Cl.[4] C07D *493/22***
**U.S. Cl. 549—267** **6 Claims**

1. A compound of the Formula I:



wherein R is

(a) —$COCH_2CH_2CH_3$, or

(b) —$COCH_3$; and

wherein $R_1$ is

(a) —$COCH_2CH(CH_3)_2$,

(b) —$COCH_2CH_2CH_3$, or

(c) —$COCH_3$.

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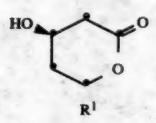
## 4,611,067
## PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS AND INTERMEDIATE COMPOUNDS EMPLOYED THEREIN

**Ralph P. Volante, East Windsor; Thomas R. Verhoeven, Cranford; Meyer Sletzinger, North Plainfield; James M. McNamara, Rahway; Thomas M. H. Liu, Westfield, and Edward G. Corley, Old Bridge, all of N.J., assignors to Merck & Co., Inc., Rayway, N.J.**

**Filed Jan. 31, 1985, Ser. No. 696,963**
**Int. Cl.[4] C07D *309/30*; C07C *102/08, 102/00, 103/167, 103/173***
**U.S. Cl. 549—292** **9 Claims**

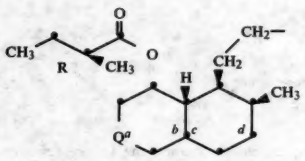
1. A process for the preparation of compounds of the following structural formula (I):



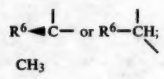
(I)

wherein $R^1$ is selected from the group consisting of:

(a)



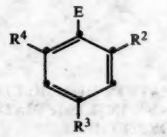
wherein
Q is



$R^6$ is H or OH;

R is hydrogen or methyl, and a and c except when $R^6$ is OH or b and d represent double bonds or all of a, b, c and d are single bonds; or

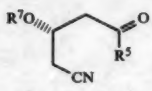
(b)



wherein E is —$CH_2$—, —$CH_2CH_2$— or —CH=CH—; $R^2$ and $R^3$ independently are $C_{1-3}$ alkyl fluoro, chloro or bromo; and $R^4$ is phenyl, benzyloxy, substituted phenyl or substituted benzyloxy in which the phenyl group in each case is substituted with one or more substituents selected from $C_{1-3}$ alkyl, fluoro, bromo or chloro;

which comprises:

(A) reacting a compound of the formula (II):



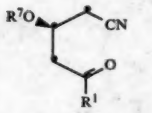
(II)

wherein $R^5$ is $C_{1-5}$ alkyloxy, benzyloxy or 2-thiopyridinyl; and $R^7$ is $C_{1-5}$ alkyl, benzyl, $C_{2-5}$ alkoxyalkyl, $C_{3-6}$ alkoxyalkoxyalkyl, tri-$C_1$-$C_5$-alkylsilyl or tetrahydropyranyl

with a compound of the formula (III):

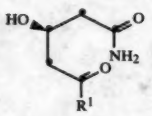
$R^1X$ (III)

wherein $R^1$ is defined above; and X is a metal atom or metal complex selected from Li, MgCl, MgBr, $(CuMgCl)_{1/2}$, $(CuMgBr)_{1/2}$, $(CuLi)_{1/2}$, $(CuLi_2CN)_{1/2}$ or $CeCl_2$ to afford a compound of the formula (IV):



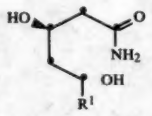
(IV)

(B) hydrolyzing the compound of the formula (IV) under acidic conditions to afford a compound of the formula (V):



(V)

(C) stereospecifically reducing the ketone function in a compound of the formula (V) with tri-$C_{1-5}$-alkylborane and alkali metal borohydride at low temperatures to afford a compound of the formula (VI):



(VI)

(D) lactonizing the compound of the formula (VI) by first saponifying the amide followed by acidic treatment to afford the compound of the formula (I).

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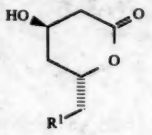
**4,611,068**

## PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS AND INTERMEDIATE COMPOUNDS EMPLOYED THEREIN

**Yvan Guindon, Ile Bizard; Howard E. Morton, Dollard des Ormeaux, and Christiane Yoakim, Montreal, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada**

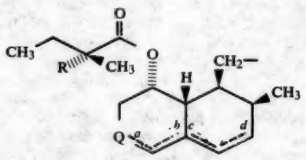
**Filed Nov. 19, 1984, Ser. No. 673,231**
**Int. Cl.[4] C07D *309/30***
**U.S. Cl. 549—292** **9 Claims**

1. A process for the preparation of a compound of the following general structural formula (I):



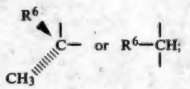
(I)

wherein $R^1$ is selected from the group consisting of:



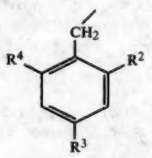
(a)

wherein Q is



$R^6$ is H or OH:

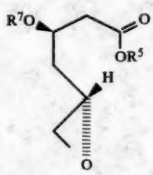
R is hydrogen or methyl, and a and c, except when $R^6$ is OH, or b and d represent double bonds or all of a, b, c, and d are single bonds; or



(b)

wherein $R^2$ and $R^3$ are independently $C_{1-3}$ alkyl, fluoro, chloro or bromo; and $R^4$ is hydrogen, phenyl, benzyloxy, substituted phenyl or substituted benzyloxy in which the phenyl group in each case is substituted with one or more substituents selected from $C_{1-3}$ alkyl, fluoro, bromo or chloro, which comprises:

(A) reacting a compound of the formula (II):



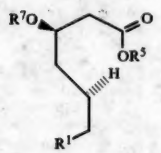
(II)

wherein $R^5$ is $C_{1-5}$ alkyl or benzyl; and $R^7$ is $C_{1-5}$ alkyl, benzyl, $C_{2-5}$ alkoxyalkyl or $C_{3-6}$ alkoxyalkoxyalkyl; with a compound of the formula (III):

$R^1X$ (III)

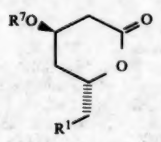
wherein $R^1$ is defined above and X is a metal atom or metal complex selected from Li, MgCl, MgBr,

$(CuMgCl)_{\frac{1}{2}}$ or $(CuMgBr)_{\frac{1}{2}}$ to afford a compound of the formula (IV):



(IV)

(B) lactonizing the compound of the formula (IV) at a temperature between 0° and 25° C. in an inert solvent with a catalytic amount of an acid to afford the compound of formula (V):



(V)

and

(C) removing the $R^7$ group with an organoboron halide to afford the compounds of formula (I).

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**4,611,069**

**PROCESS FOR PREPARING GAMMA-CAPROLACTONE BY ISOMERIZATION OF EPSILON-CAPROLACTONE**

**Jawad H. Murib, Cincinnati, and John H. Kahn, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.**

**Filed Jun. 25, 1984, Ser. No. 624,307**

**Int. Cl.[4] C07D *307/32***

**U.S. Cl. 549—326** **2 Claims**

1. A process for preparing gamma-caprolactone comprising isomerizing epsilon-caprolactone in an aqueous medium in the presence of a catalytically effective amount of hydriodic acid or hydrobromic acid with a catalyst-promoting effective amount of ruthenium metal on a carbon support, at a temperature in the range of about 200° C. to about 225° C., wherein the mole ratio of water to epsilon-caprolactone is in the range of about 1:1 to about 10:1.

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**4,611,070**

**SPIRODIBENZOPYRANS**

**Andreas Oberlinner, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany**

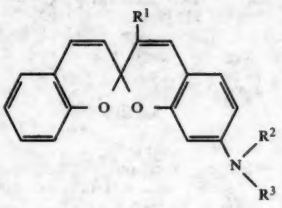
**Continuation of Ser. No. 90,409, Nov. 1, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 336,703**

**Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847690**

**Int. Cl.[4] C07D *311/58***

**U.S. Cl. 549—344** **3 Claims**

1. A compound of the formula:



where $R^1$ is methyl or isopropyl and

is dibenzylamino.

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**4,611,071**

**METAL ALKYL PROCESS**

**Robert N. DePriest, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Feb. 13, 1985, Ser. No. 701,292**

**Int. Cl.[4] C07F *9/72, 9/90, 9/94***

**U.S. Cl. 556—70** **27 Claims**

1. A process for making Group VA metal alkyls, said process comprising reacting a halide of a Group VA metal with a hydrocarbyl magnesium halide Grignard reagent—polyether complex in an inert ether reaction medium in which the Group VA metal alkyl product is soluble.

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**4,611,072**

**HEAT-SENSITIVE RECORDING MATERIAL**

**Hermann Nachbur, Reinach, and Christel Tempel, Richen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

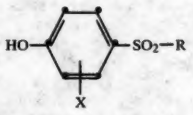
**Division of Ser. No. 557,013, Dec. 1, 1983. This application Jun. 5, 1985, Ser. No. 741,330**

**Claims priority, application Switzerland, Dec. 10, 1982, 7215/82**

**Int. Cl.[4] C07F *3/06, 5/06***

**U.S. Cl. 556—135** **5 Claims**

1. An aluminum or zinc phenate of a phenolsulfonyl compound of the formula



(I)

wherein

R is phenyl, or phenyl which is substituted by halogen, lower alkyl, lower alkoxy, nitro or methylenedioxy, and

X is hydrogen, halogen, lower alkyl or lower alkoxy.

4,611,073

## PREPARATION OF HIGHER SILICON CARBOXYLATES IN IMPROVED YIELDS USING AN INERT GAS

Richard F. Miller, Humble, and Marilyn W. Blaschke, Pearland, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1985, Ser. No. 814,127
Int. Cl.[4] C07F 7/02
U.S. Cl. 556—442 13 Claims

1. The method of producing higher tetracarboxylates of silicon comprising reacting a lower silicon tetracarboxylate with at least one higher carboxylic acid at a temperature sufficiently high to vaporize volatile material and recovering the silicon tetracarboxylate of said higher carboxylic acid.

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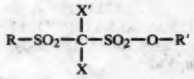
4,611,074

## (ALKYLSULFONYL)METHANESULFONATES AS ANTICANCER AGENTS

Y. Fulmer Shealy, and Charles A. Krauth, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Continuation-in-part of Ser. No. 558,435, Dec. 6, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,831
Int. Cl.[4] C07C 143/68
U.S. Cl. 558—51 11 Claims

1. Compounds having the formula:



wherein R is a lower alkyl group, X and X' individually are hydrogen or lower alkyl, and R' is a halogenated lower alkyl group.

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4,611,075

## PREPARATION OF 4-(α,α-DIHYDROCARBYL-α-CYANO-METHYL)-PHENOLS

Charles R. Everly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 552,283, Nov. 16, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,284
Int. Cl.[4] C07C 120/00
U.S. Cl. 558—351 10 Claims

1. A process for the preparation of 4-α,α-dihydrocarbyl-α-cyano-methyl)-2,6-mono or dihydrocarbyl substituted phenols which comprises reacting the corresponding 2,6-mono or dihydrocarbyl substituted phenol with a ketone and an alkali metal cyanide or an alkaline earth metal cyanide in an inert reaction solvent and thereafter recovering said 4-(α,α-dihydrocarbyl-α-cyano-methyl)phenol.

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4,611,076

## CHIRAL CYANOHYDRINATION PROCESS

Walter Dong, and Peter S. Friend, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 26, 1985, Ser. No. 749,618
Int. Cl.[4] C07C 121/75
U.S. Cl. 558—351 21 Claims

1. A process for the preparation of a chiral cyanohydrin or a mixture enantiomerically enriched therein which comprises treating an aromatic aldehyde in an inert, aprotic solvent with cyanide ions in the presence of a cyclo(D-phenylalanyl-D-histidine) or cyclo(L-phenylalanyl-L-histidine) dipeptide catalyst and an aralkyl alcohol.

4,611,077

## INCREASING ENANTIOMERIC SELECTIVITY IN CHIRAL CYANOHYDRINATION

Walter Dong, Houston, Tex., and Donald W. Stoutamire, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 26, 1985, Ser. No. 749,619
Int. Cl.[4] C07C 121/75
U.S. Cl. 558—351 11 Claims

1. A process for the preparation of a chiral aromatic cyanohydrin or a mixture enantiomerically enriched therein which comprises treating an aromatic aldehyde in an inert, aprotic solvent with hydrogen cyanide or a generator thereof in the presence of a cyclo(D-phenylalanyl-D-histidine) or cyclo(L-phenylalanyl-L-histidine) dipeptide catalyst and pretreating the aldehyde or solution thereof in the solvent with an acid or acidic-acting material to remove basic nitrogen compound catalyst posions or impurities which adversely effect enantiomeric selectivity.

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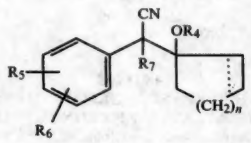
4,611,078

## SUBSTITUTED PHENYLACETONITRILES

G. E. Morris Husbands, Berwyn; John P. Yardley, Gulph Mills, and Eric A. Muth, West Chester, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 545,701, Oct. 26, 1983, Pat. No. 4,535,186, which is a continuation-in-part of Ser. No. 486,594, Apr. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 449,032, Dec. 13, 1982, abandoned. This application May 22, 1985, Ser. No. 736,747
Int. Cl.[4] C07C 121/75
U.S. Cl. 558—410 5 Claims

1. A compound of the formula:



in which the dotted line represents optional unsaturation, and

$R_4$ is hydrogen or alkyl of 1 to 6 carbon atoms;

$R_5$ and $R_6$, one of which may be hydrogen, are ortho or para substituents, independently selected from the group consisting of hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, aralkoxy of 7 to 9 carbon atoms, alkanoyloxy of 2 to 7 carbon atoms, alkylmercapto of 1 to 6 carbon atoms, halo or trifluoromethyl;

$R_7$ is hydrogen or alkyl of 1 to 6 carbon atoms; and

n is one of the integers 0, 1, 2, 3 or 4.

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4,611,079

## PROCESS FOR THE PREPARATION OF N-ARYL DI- OR POLYURETHANES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 542,824, Oct. 17, 1983, abandoned, which is a continuation of Ser. No. 135,304, Mar. 31, 1980, abandoned. This application Jun. 11, 1984, Ser. No. 619,562
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917569
Int. Cl.[4] C07C 125/073, 125/077
U.S. Cl. 560—25 18 Claims

1. A process for the preparation of N-aryl di- or polyurethanes, comprising reacting at a temperature of from about 190° C. to 300° C. an aromatic primary amine selected from the group consisting of

(a) aromatic diamines

(b) aromatic polyamines, and

(c) mixtures thereof;
with urea and a primary or secondary aliphatic, cycloaliphatic, or arylaliphatic alcohol wherein the mole ratio of amino groups to urea to hydroxyl groups is in the range of 1:0.8:5 to 1:10:100; and separating said di- or polyurethanes from unreacted starting materials and partly reacted starting materials.

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**4,611,080**

## PREPARATION OF HALOGENATED AROYLACETIC ACID ESTERS

**Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

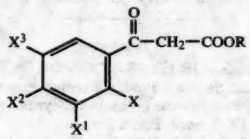
**Filed Jul. 12, 1985, Ser. No. 754,692**

**Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426482**

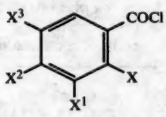
**Int. Cl.[4] C07C *69/76***

**U.S. Cl. 560—51** **10 Claims**

1. A process for the preparation of a halogenated aroylacetic acid ester of the formula



in which
R is alkyl with 1–6 carbon atoms,
X and $X^2$ each independently is halogen, and
$X^1$ and $X^3$ each independently is hydrogen or halogen, comprising reacting a benzoyl chloride of the formula



with dichloroethylene in the presence of anhydrous aluminum chloride to form the corresponding benzene trichloroethyl ketone, dehydrochlorinating the trichloroethyl ketone to form the corresponding benzene dichlorovinyl ketone, and treating the dichlorovinyl ketone with an alcoholate and then with an aqueous acid.

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**4,611,081**

## PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS INTERMEDIATES

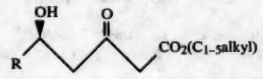
**Joseph E. Lynch, Plainfield; Ichiro Shinkai, Westfield, and Ralph P. Volante, East Windsor, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Jul. 5, 1985, Ser. No. 752,323**

**Int. Cl.[4] C07C *69/74, 69/76***

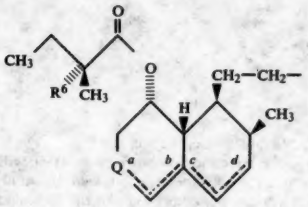
**U.S. Cl. 560—53** **6 Claims**

1. A process for the preparation of a compound represented by the following general formula (I):



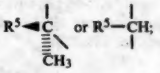
(I)

wherein
R is:

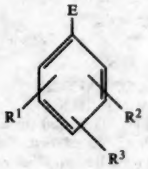


(A)

wherein
Q is



$R^5$ is H or OH;
$R^6$ is hydrogen or methyl; and a, b, c, and d represent optional double bonds, especially where b and d represent double bonds or a, b, c and d are all single bonds; or

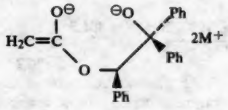


(B)

wherein
E is —CH=CH— or —$CH_2CH_2$—; and
$R^1$, $R^2$ and $R^3$ are each selected from
halo such as chloro, bromo or fluoro,
$C_{1-4}$alkyl,
$C_{1-4}$haloalkyl,
phenyl
phenyl with one or more substituents independently selected from
halo,
$C_{1-4}$alkyl, and
$C_{1-4}$alkoxy, or
$R^4O$ in which $R^4$ is
phenyl,
halophenyl, or
substituted phenyl-$C_{1-3}$alkyl wherein the substituents are selected from halo and $C_{1-4}$ haloalkyl;
which comprises:
(1) reacting a compound of the formula (II)

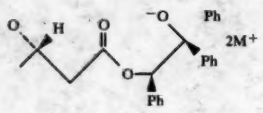
RCHO (II)

wherein R is defined above, with the enolate of (R)-2-acetoxy-1,2,2-triphenylethanol of the formula (III)



(III)

wherein $M^+$ is a cation derived from sodium, potassium, lithium, magnesium, or zinc, to afford a compound of the formula (IV)



(IV)

wherein R and $M^+$ are defined above; and

(2) reacting the compound of the formula (IV) with the enolate of a $C_{1-5}$ alkylacetate, followed by mild acid hydrolysis to obtain the compounds of the formula (I).

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4,611,082

## PRODUCTION OF HEX-3-ENEDIOATE ESTERS FROM 1,4 DIALKOXY BUTENES

Albert S. C. Chan, St. Charles, and Donald E. Morris, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 9, 1984, Ser. No. 669,720
Int. Cl.[4] C07C *67/37*
U.S. Cl. 560—204 17 Claims

1. A process for the production of dialkyl hex-3-enedioate esters from 1,4-dialkoxy substituted-2-butenes comprising carbonylating a solution of the substituted butene in an aprotic, polar non-basic solvent selected from the group consisting of nitriles; bis(2-methoxy-2-butene; bis(2-methoxyethyl)ether; and methylene chloride at 80°–140° C. in the presence of a catalyst comprising a halide of a transition metal.

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4,611,083

## LIQUID, UREA GROUP-CONTAINING POLYISOCYANATE MIXTURES

Ingolf Buethe, Boehl-Iggelheim; Matthias Marx, Bad Durkheim, and Willibald Schönleben, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,077
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342564
Int. Cl.[4] C07C *119/048*
U.S. Cl. 560—351 2 Claims

1. Urea group-containing polyisocyanate mixtures which are liquid at room temperature and have an isocyanate group content of from 15 to 30 weight percent and a diphenylmethane diisocyanate content of from 55 to 90 weight percent, obtained by reacting at a temperature of 80° C. or less in such amounts that the $NCO:NH_2$ equivalent ratio is from 1:0.005 to 1:0.35, a polyoxyalkylene polyamine having an amine functionality of from 2 to 5 and an amine number from 20 to 250 with an excess of a diphenylmethane diisocyanate isomer mixture containing from 40 to 98 weight percent 4,4'-diphenylmethane diisocyanate, from 60 to 2 weight percent 2,4'-diphenylmethane diisocyanate, and from 0 to 2 weight percent 2,2'-diphenylmethane diisocyanate, said weight percents being based on the total weight of the diphenylmethane diisocyanate mixture.

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4,611,084

## CATALYTIC ETHERIFICATION OF PHENOLS TO ALKYL ARYL ETHERS

Allen B. Mossman, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 25, 1985, Ser. No. 801,562
Int. Cl.[4] C07C *41/09*
U.S. Cl. 568—630 12 Claims

1. A process for etherifying phenols comprising reacting phenols at elevated temperature and pressure with a reactant selected from the group consisting of alcohol, ether and mixtures thereof in the presence of a catalyst comprising a sulfated oxide of a Group VIIB metal selected from the group consisting of Mn, Re and mixtures thereof on a support.

4,611,085

## VAPOUR PHASE HYDROGENATION OF ESTERS

Melanie Kitson, Staines, England, assignor to The British Petroleum Company p.l.c., London, England

PCT No. PCT/GB84/00133, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/04297, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 18, 1984, Ser. No. 678,567
Int. Cl.[4] C07C *29/136*
U.S. Cl. 568—885 9 Claims

1. A process for the production of an alcohol by hydrogenation of an ester of a carboxylic acid having 1 to 20 carbon atoms with a hydrogenation catalyst comprising a Group VIII element, a promoter, and a carbon support is characterised in that (1) the Group VIII element is ruthenium, nickel, or rhodium, (2) the promoter is introduced on to the carbon as a water stable compound of Group IA, metal excluding lithium Group IIA metal excluding beryllium and magnesium, a lanthanide or actinide, and (3) the carbon has a BET surface area of at least 100 $m^2/g$, and a ratio of BET to basal plane surface area not greater than 4:1, and (4) the hydrogenation is carried out in the vapour phase at a temperature in the range 100° C. to 400° C. at a total gas hourly space velocity of 100 to 120 000.

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4,611,086

## PROCESS FOR HYDRATION OF OLEFINS

Claude Gueguen, Septeme Pont L'Eveque; Francois Figueras, Montpellier, and Francois Fajula, Theyran, all of France, assignors to Elf France, Paris, France

Filed May 3, 1984, Ser. No. 606,641
Claims priority, application France, May 6, 1983, 83 07649
Int. Cl.[4] C07C *29/04, 31/12, 31/125*
U.S. Cl. 568—897 12 Claims

1. A process for the preparation of an aliphatic alcohol which comprises: hydrating an olefin at a temperature of from about 100° to 400° C. and a pressure of from about 20 to 100 bars, at a liquid spatial velocity of the feed (VVH) of from about 0.2 to 5 m3/m3/h at a molar ratio water/olefin between about 1:1 and 8:1, in the present of a catalyst comprising dealuminized offretite zeolitic crystalline silicoaluminate.

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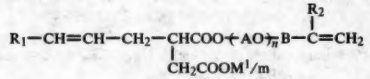
4,611,087

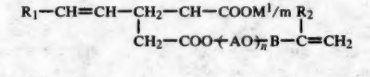
## SALTS OF ALKENYLSUCCINIC MONOESTERS

Osamu Yamashita; Noboru Moriyama, both of Utsunomiya; Shoji Ootani, Oosaka, and Katsuyo Wasamoto, Wakayama, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,097
Claims priority, application Japan, Nov. 8, 1982, 57-195636; Dec. 24, 1982, 57-229555
Int. Cl.[4] C07C *69/40*
U.S. Cl. 560—81 1 Claim

1. A salt of an alkenylsuccinic monoester represented by the formula (I), (II) or mixtures thereof


(I)


(II)

in which

$R_1$ represents a hydrocarbon group with or without a substituent,

$R_2$ represents a hydrogen atom or a methyl group,

A represents an alkylene group having from 2 to 4 carbon atoms,

B represents a carbonyl group or a methylene group,

M is a monovalent or divalent cation selected from the group consisting of sodium, potassium, lithium, calcium,

magnesium, ammonium, monoalkylammonium, dialkylammonium, trialkylammonium and ethanolammonium,
n has a value ranging from 0 to 100, provided that when B represents a carbonyl group, n is not zero, and
m is the number of the ionic valence of M.

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**4,611,088**

## PROCESS FOR PREPARING D-α-(6-METHOXY-2-NAPHTYL) PROPIONIC ACID

**Yoshio Ohara, Narashino; Kazutaka Arai, Yotsukaido; Yasuhiro Takahashi, Chiba, and Yasuo Takakuwa, Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan**

**Filed Oct. 1, 1984, Ser. No. 656,457**

**Claims priority, application Japan, Oct. 11, 1983, 58-189534**

**Int. Cl.[4] C07C *65/30***

**U.S. Cl. 562—466** **15 Claims**

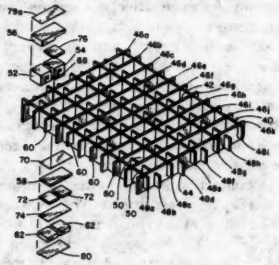
1. A process for preparing a d-α-(6-methoxy-2-naphthyl)-propionic acid, which comprises hydrolyzing an ester of d-α-(6-methoxy-2-naphthyl)propionic acid in an aqueous solution consisting essentially of water and a basic catalyst.

4,611,089

## THERMOELECTRIC CONVERTER

Norbert B. Elsner; John C. Bass, both of La Jolla, and Charles C. Morris, San Diego, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jun. 11, 1984, Ser. No. 619,052
Int. Cl.[4] H01L *35/02, 35/30*
U.S. Cl. 136—230 7 Claims



1. A thermoelectric converter comprising:
a heat source having a mating face;
a heat sink having a mating face; and
a thermoelectric conversion module disposed between said heat source and said heat sink and engaging said faces, said module including a plurality of thermoelectric elements, and an electrically insulative holder, said holder having a first side disposed adjacent said heat source and a second side disposed adjacent said heat sink;
said holder comprising a plurality of spaced, parallel first walls and a plurality of spaced, parallel second walls extending normal to said first walls and defining therewith an array of compartments each containing a respective said thermoelectric element,
said module further comprising a compressed resilient, thermally conductive pad positioned in each compartment, said first walls defining columns of element pairs, each pair including a P-type thermoelectric element and an N-type thermoelectric element, said first walls extending from said first side to said second side, said second walls defining rows of elements with adjacent elements in a row being of opposite type, every other of said second walls extending to said first side but short of said second side, with the remaining second walls extending to said second side but short of said first side, whereby each column of elements can be electrically series connected within the envelope of said holder.

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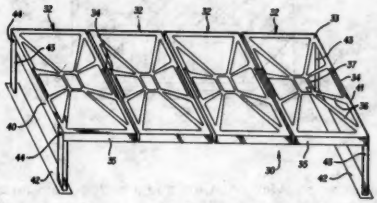
4,611,090

## SEMIRIGID PHOTOVOLTAIC MODULE ASSEMBLY AND STRUCTURAL SUPPORT THEREFOR

Gary C. Catella, Chagrin Falls; Ronald C. Cull, Milan; David A. Dilts, Gates Mills; Paul E. Koch, and Robert A. Hartman, both of Chagrin Falls, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 28, 1984, Ser. No. 687,098
Int. Cl.[4] H01L *25/02*
U.S. Cl. 136—251 38 Claims

24. A semirigid array of flexible photovoltaic modules, which semirigid array comprises:
(a) individual flexible photovoltaic modules and individual semirigid support members for said modules, each individual support member having a frame adapted to be in contact with the perimeter of a photovoltaic module, an inwardly facing flange extending upward from the frame and which overlaps a portion of the module perimeter, a said flexible photovoltaic module being gripped by said flange, a skirt depending downward from the frame, rib stiffeners integral to the frame and extending inward and adapted to contact the photovoltaic module, and means for attaching the photovoltaic module to the support member to form a photovoltaic assembly;
(b) means for fixedly attaching individual semirigid support members to adjacent semirigid support members to form an array; and



(c) means for securing at least one semirigid support member to a base so that the array of flexible photovoltaic modules may be displayed in the desired configuration.

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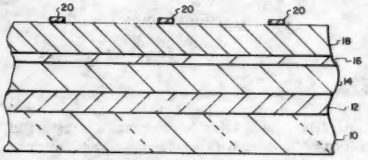
4,611,091

## $CUINSE_2$ THIN FILM SOLAR CELL WITH THIN CDS AND TRANSPARENT WINDOW LAYER

Uppala V. Choudary, Chatsworth; Yuh-Han Shing, Thousand Oaks; Richard R. Potter, Chatsworth; James H. Ermer, Los Angeles, and Vijay K. Kapur, Northridge, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 6, 1984, Ser. No. 678,854
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—260 5 Claims



1. A thin film photovoltaic device comprising a first layer of copper indium diselenide p-type semiconductor, a second layer in overlying contact with said first layer and formed of n-type cadmium sulfide semiconductor having a thickness of less than 2500Å, and a third layer in overlying contact with said second layer and formed of a substantially transparent degenerate wide bandgap n-type semiconductor.

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4,611,092

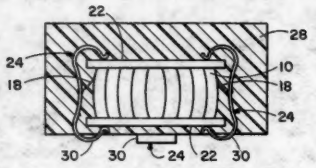
## SURFACE MOUNT PACKAGE FOR TOROIDS

William K. Pederson, Jr., and John J. Tils, both of Cornelius, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 21, 1985, Ser. No. 703,774
Int. Cl.[4] H01F *15/10*
U.S. Cl. 174—52 PE 4 Claims

1. A surface mount package for an electrical element having conductive leads comprising:
a pair of non-conductive plates, said electrical element being placed between said plates to form a sandwich;
means for holding said sandwich together to form a sandwich assembly, the leads of said electrical element being connected to said holding means and a portion of said

holding means forming an electrical contact pad for surface mounting of said package on a circuit board; and




a housing having a flat top and a bottom, said housing enclosing said sandwich assembly except for said electrical contact pad which is exposed at said bottom.

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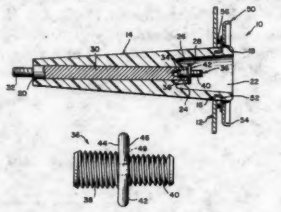
**4,611,093**

## ELECTRICAL BUSHING HAVING A REPLACEABLE STUD

**Donald J. Farmer, Pine Bluff, Ark., and Joseph F. Powell, III, Halifax, Va., assignors to Colt Industries Operating Corp, New York, N.Y.**

**Filed Jan. 20, 1984, Ser. No. 572,378**
**Int. Cl.[4] H01B** *17/26;* **F16B** *31/00, 35/00*
**U.S. Cl. 174—152 R** **3 Claims**




1. An electrical bushing for use with a transformer having a transformer housing with an outer wall and electrical components mounted within the transformer housing comprising:

a bushing body formed of electrical insulating material adapted to be mounted on the transformer housing to extend through the outer wall thereof, said bushing body including first and second body terminal ends wherein said first body terminal end is adapted to be inserted through the transformer outer wall and said second body terminal end is adapted to extend outside of said transformer outer wall, a cavity formed in one end of said bushing body to open outwardly of said transformer outer wall at said second body terminal end and a boss extending into and enclosed by said cavity and spaced within said cavity so as to be surrounded by an annular air gap, said boss having an upper wall,

electrical conductor means mounted within said bushing body and having an upper end which is adjacent to and which extends from the upper wall of said boss therethrough to said first body terminal end for connection with said electrical components, said electrical conductor means including an open ended threaded bore which communicates with said boss, and

replaceable stud means removably mounted on said boss in contact with said electrical conductor means to complete an electrical connection therewith, said replaceable stud means having a first elongated shank and a second elongated shank which are colinear and separated by an annular flange formed in one piece with said first and second elongated shanks which engages said upper wall of said boss and said upper end of said conductor means to properly seat said replaceable stud means, said annular flange including a removal tool engaging means formed thereon to facilitate disengagement of the replaceable stud means from said boss, said first elongated shank being formed with a diameter which is greater than that of said second elongated shank and being received by said boss to contact said electrical conductor means, the first elongated shank being formed of electrically conductive material to complete an electrical connection from said electrical conductor means to said second elongated shank and provided with external threads which engage the threaded open ended bore of said conductor means, and said second elongated shank being formed of electrically conductive material to provide an external terminal for said transformer which terminates within the confines of the cavity in said bushing body with said replaceable stud means mounted on said boss with said first elongated shank in contact with said conductor means, said second elongated shank being formed to be weaker than said first elongated shank so as to break under stress before said first elongated shank, the second elongated shank being formed to be weaker around the section of said second elongated shank which is in contact with the upper surface of the flange.

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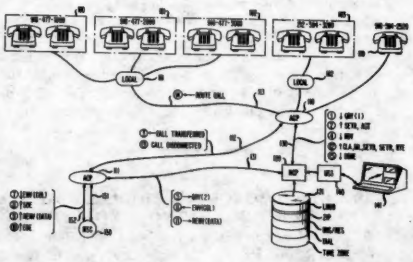
**4,611,094**

## METHOD FOR CUSTOMER DEFINABLE TELEPHONE CAPABILITY

**Richard L. Asmuth, Little Silver, N.J.; Renato M. Ermann, Gahanna, Ohio; Mark A. Gauldin, Wheaton, Ill.; George W. Gawrys, Ocean Township, Monmouth County, N.J.; Roger E. Stone, Naperville, and Marjorie P. Yuhas, Glen Ellyn, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Dec. 1, 1983, Ser. No. 557,128**
**Int. Cl.[4] H04M** *3/42, 15/04*
**U.S. Cl. 179—7.1 TP** **26 Claims**



25. A method of controlling the operations of a telephone switching office to provide call processing operations for the disposition of calls directed to telephone customers, comprising the steps of

executing a different customer program for each of the customers in response to originations of calls to the customers, said customer programs thereby ascertaining specified parameters of the individual calls and generating call processing commands according to the specified parameters, and

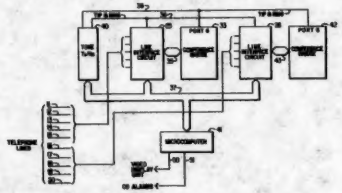
sequentially executing at the office individual ones of a plurality of independent and discrete primitive call processing capabilities specified by the commands thereby to process the call in accordance with the instructions of the customer program.

## 4,611,095

## TELEPHONE CONFERENCE BRIDGE SYSTEM

**Vincent G. LeBlanc, and Allan B. Cameron, both of Saint John, Canada, assignors to The New Brunswick Telephone Company Limited, St. John, Canada**

**Filed Jul. 8, 1983, Ser. No. 512,128**
**Claims priority, application Canada, Oct. 25, 1982, 414136**
**Int. Cl.[4] H04M *3/56***
**U.S. Cl. 179—18 BC** **4 Claims**



1. A telephone conference bridge system for interconnecting a plurality of telephone lines in a conference connection comprising a line interface circuit connected between said telephone lines and a conference bridge circuit, a tone transmitter/receiver connected to said line interface circuit, and a computer connected to said line interface circuit and said tone transmitter/receiver, said line interface circuit having means for detection of incoming calls on said lines and, via said tone transmitter/receiver, indicating each said detection to said computer, said computer storing information regarding the busy/idle status of said telephone lines and controlling relay means in said interface circuit for connecting each line having an incoming call to the bridge circuit, said relay means being driven by relay drivers actuated by the computer via a peripheral interface adapter, wherein an incoming call on a line is detected by a ring detector in the line interface circuit, said ring detector sending a signal to the computer via a peripheral interface adapter to indicate the existence of the incoming call, said computer causing the tone transmitter/receiver to send tone signals to an incoming caller and only connecting the caller to the bridge system upon receipt of a predetermined reply sequence of tones, one of said lines being designated a "Chairman's Port" and said interface circuit having means whereby only the Chairman's Port can make outgoing calls from the bridge system by connecting said one of said lines to another one of said lines, a predetermined tone code via the Chairman's Port causing the computer to block all idle lines after a conference is established.

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## 4,611,096

## TELEPHONE OFFICE SERVICE ASSIST AND HANDOFF

**Richard L. Asmuth, Little Silver, N.J.; Melchior J. DiCarlo-Cottone, Wheaton, Ill.; Renato M. Ermann, Gahanna, Ohio; Mark A. Gauldin, Wheaton, Ill.; George W. Gawrys, Ocean Township, Monmouth County, N.J.; Dattatraya G. Raj-karne; Roger E. Stone, both of Naperville, Ill., and Marjorie P. Yuhas, Glen Ellyn, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

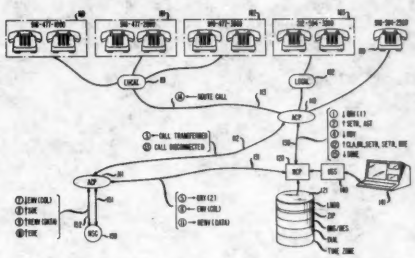
**Filed Dec. 1, 1983, Ser. No. 557,127**
**Int. Cl.[4] H04M *3/42, 7/06;* H04Q *3/72***
**U.S. Cl. 179—18 B** **13 Claims**

12. A method of controlling the operations of a telephone office serving a call to obtain call processing feature capability otherwise unavailable at the serving telephone office, comprising the steps of

interrogating a file associated with a specific customer in response to a call to the customer, the file containing instructions specifying the performance and order of performance of ones of a plurality of independent call processing primitives for processing the call in accordance with the customer file,

determining if the serving office is able to perform all the primitives required by the customer file,

if the serving office is unable to perform a required primitive, selecting a second office able to perform the primitive unavailable in the serving office,



transferring control of the call to the second office and transmitting information to the second office informing it to execute the primitive unavailable at the serving office.

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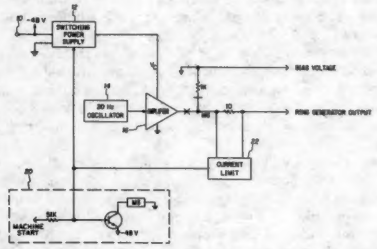
## 4,611,097

## SINE WAVE RING GENERATOR

**Mark W. Grimes, Lombard, Ill., assignor to Rockwell International, Downers Grove, Ill.**

**Filed Jun. 13, 1984, Ser. No. 620,359**
**Int. Cl.[4] H04M *5/00;* H03K *5/156***
**U.S. Cl. 179—84 A** **5 Claims**



1. A sine wave ring generator for use with a telephone circuit and an input voltage having a predetermined range, said generator comprising:

switching power supply means for providing a predetermined DC output voltage from said input voltage range;

oscillator means for providing a pseudo-sine wave output with a predetermined frequency;

amplifier means for amplifying said pseudo-sine wave and for receiving said predetermined DC voltage and having a low output impedance thereby maintaining regulation of a circuit output voltage and a predetermined range and supplying a circuit output current;

a bias input operatively connected to the output of said amplifier means;

means for enabling said disabling said switching power supply means operatively connected to said switching power supply means providing modulation through an optical coupler providing isolation of said power supply means and floating of said generator; and

current limiting means having an optical coupler for providing isolating of said amplifier means and for limiting said output current to a predetermined value when said means for enabling and disabling has enabled said switching

power supply means, whereby a plurality of DC voltages may be applied to said bias input.

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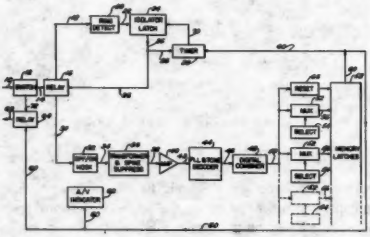
**4,611,098**

## CODED TELEPHONE ACCESS SYSTEM

**Paul J. Giorgio, 285 River Ave., Providence, R.I. 02908, and Paul M. Duhaime, 18 Jade Rd., Coventry, R.I. 02816**

**Filed Dec. 4, 1984, Ser. No. 677,945**
**Int. Cl.[4] H04M *1/21, 11/02***
**U.S. Cl. 179—84 C** **5 Claims**



1. A dual tone multiple frequency access system comprising:

input switching means for transmitting a telephone input signal;

operating means connected to said input switching means for receiving said telephone signal, said operating means having a plurality of output terminals with each output terminal connected to represent a different digit from 0 through 9, said operating means also for providing an output signal on selected members of said plurality of output terminals in a sequence that is determinative of the numerical representation of the received telephone input signal;

select switching means including a plurality of select switches in sequential order connected to said operating means output terminal for providing an output signal if signals are received from predetermined members in a predetermined sequence within a predetermined period of time;

relay means having a relay connected to said select switching means and said relay having open contacts connected to said input switching means and adapted to connect to various selected output components, said relay means for closing said open contacts to transmit said telephone input signal through said contacts upon actuation of said relay upon receipt of a signal from said select switching means;

said input switching means further comprises an input switch for transmitting a telephone input signal, sensing means connected to said input switch for providing an output signal upon detection of a ring signal, timing means connected to said sensing means for starting a predetermined timing interval upon receipt of said sensing meansoutput signal, for being stopped from further operation upon operation of said relay means and for inhibiting conduction of said telephone input signal upon expiration of said timing interval when not stopped by said relay means from further operation, ring detect switching means connected to said sensing means for inhibiting transmission of the telephone input signal from said input switch to said sensing means and redirecting said telephone input signal, and OFF/ON hook detecting means connected to said ring detect switching means for receiving the redirected telephone input signal; and

said operating means further comprises phase lock loop and tone decoder means connected to said OFF/ON hook detecting means for receiving said redirected telephone input signal and for providing a plurality of output digital code signal indicative of said redirected telephone input signal, and digital combiner means connected to receive said plurality of output lines for providing an output signal on a predetermined output line wherein the predetermined output line selected is determinative of the numerical value of the digital code received.

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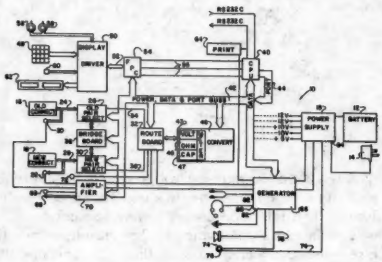
**4,611,099**

## CABLE ANALYZER WITH D. C. FUNCTIONS

**Jimmy C. Ray, and H. Wayne Mathews, both of Denison, Tex., assignors to Industrial Innovations, Inc., Denison, Tex.**

**Filed Oct. 31, 1984, Ser. No. 666,836**
**Int. Cl.[4] H04B *3/46***
**U.S. Cl. 179—175** **19 Claims**



1. A telephone cable analyzer comprising:

a. at least one plug connector whereby a plurality of telephone wires in pairs may be attached by the plug to the analyzer,

b. a routing circuit,

c. at least one pair selector interconnecting the plug and routing circuit,

d. said pair selector including means for attaching any pair of wires to the routing circuit,

e. a converter connected to the routing circuit,

f. said converter including means for converting analog signals to binary digital signals,

g. said routing circuit including means for routing a pair of wires to said converter, and

h. a central processing unit connected to the pair selector, routing circuit, and converter,

i. said central processing unit including means for controlling the pair selector, the routing circuit, and converter, and

j. said central processing unit including means for analyzing, storing, and transmitting data from the converter, routing circuit, and pair selector.

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**4,611,100**

## BUNCHING BLOCK FOR MCCULLOH CIRCUITS AND METHOD OF OPERATION

**John J. Schembri, Daly City, Calif., assignor to Pacific Bell, San Francisco, Calif.**

**Filed Oct. 24, 1984, Ser. No. 664,240**
**Int. Cl.[4] H04B *3/46***
**U.S. Cl. 179—175.3 F** **19 Claims**

1. A bunching block adapted for use in a public utility central office to interconnect a plurality of user loops in series with each other in a McCulloh circuit for connecting the series of user loops with a supervisory McCulloh receiver means adapted for monitoring selected conditions in the respective user loops, the bunching block comprising

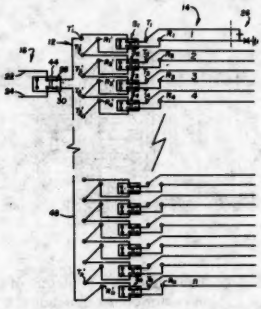
frame means,

first tip and ring connector means mounted upon said frame means and adapted for respective connection with opposite sides of the user loops,

second tip and ring connector means mounted upon said frame means and associated respectively with said first tip and ring connector means, said second tip and ring con-

nector means further being adapted for providing a series connection for the respective user loops with the McCulloh receiver means, and

separate switch means associated with each set of first tip and ring connector means and said associated second tip and ring connector means, each of said separate switch means having a normal operating position for connecting said first tip and ring connector means respectively with



said second tip and ring connector means to permit normal operation of the user loops in series with each other and with the McCulloh receiver means, each of said separate switch means being selectively operable for effectively shorting out said second tip and ring connector means for isolating at least one selected user loop to facilitate rapid location of a fault in the multiplicity of series connected user loops.

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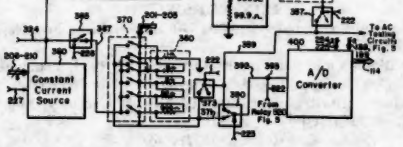
## 4,611,101
## METHOD AND APPARATUS FOR TESTING COMMUNICATION SYSTEMS

**Michael D. Walter, Webster, and Mark R. Grundtisch, Rochester, both of N.Y., assignors to TII Computer Systems, Inc., Copiague, N.Y.**

**Filed Aug. 29, 1984, Ser. No. 645,479**
**Int. Cl.[4] H04B 3/46**
**U.S. Cl. 179—175.3 R** **14 Claims**




1. An apparatus for testing communication lines comprising:

means for coupling said apparatus to a communication line;

current divider means for producing a voltage drop across a known resistance wherefrom AC and DC current can be measured, said current divider means having an input connected to said coupling means;

a first path, selectively by-passing said current divider means;

means for performing a C-weighting operation upon a signal, said means having an input selectively coupled to an output of said current divider means and to said first path;

a second path, selectively by-passing said means for performing a C-weighting operation;

means for converting a first signal to a second signal having a voltage equal to an rms value of said first signal, said means having an input for said first signal selectively coupled to an output of said means for performing a C-weighting operation and to said second path;

a third path, selectively by-passing said converting means;

an analog to digital conversion means having an output coupled to a digital output line for converting an analog signal to a digital value and supplying said value to said digital output line; and

control means for selectively connecting an input to said analog to digital conversion means to said coupling means, an output of said current divider means, said C-weighting means or said converting means;

whereby DC voltage and current, AC voltage and current and C-weighted noise measurements are selectively made.

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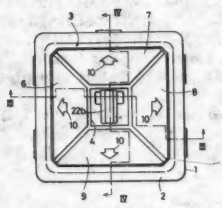
## 4,611,102
## SWITCH DEVICE FOR ANGULARLY ADJUSTING OUTER REAR MIRRORS OF AN AUTOMOTIVE VEHICLE

**Shoji Ishida, Iwakura, Japan, assignor to Takao Ooi wa, Niwa, Japan**

**Filed Dec. 27, 1984, Ser. No. 686,927**
**Claims priority, application Japan, Dec. 28, 1983, 58-203477**
**Int. Cl.[4] H01H 9/26**
**U.S. Cl. 200—5 R** **2 Claims**



1. A switch device for angularly adjusting outer rear view mirrors of an automotive vehicle comprising:

(a) an outer case having a front side with an opening of approximately rectangular shape;

(b) a first switch knob having an approximately rectangular front side, a central opening and four push portions formed between the outer and inner periphery thereof on the approximately rectangular front side, said first switch knob being mounted in the outer case so that said push portions are disposed in the opening and supported therein and so that said first switch knob is inclined to actuate said device when one of said push portions is depressed and returns to the original position when the depressed push portion is released;

(c) first switches provided in the outer case in opposed relation to the back side of the push portions so as to be operated when the switch knob is inclined for actuation, said first switches being adapted for connection with motors for controlling right-hand and left-hand rear view mirrors of an automotive vehicle;

(d) an inner case mounted in the outer case in a position opposed to said central opening such that said switches are positioned around said inner case and having a central opening formed in a front wall opposed to the opening of said switch knob;

(e) a second switch for selectively connecting said motors for driving the right-hand outer rear view mirrors or driving the left-hand outer rear view mirrors with said first switches;

(f) a second switch knob for operating said second switch,

said second switch knob projecting through the central opening of the first switch knob and said opening formed in the front wall of the inner case opposed to the opening of the second switch knob;

(g) a blocking member of approximately rectangular configuration adapted to move in a first direction and in a second direction perpendicular to the first direction and in a plane perpendicular to the direction in which the first switch knob is depressed and having slanting guiding surfaces formed on the periphery thereof corresponding to the outer periphery of said first switch knob; and

(h) a guiding member projecting around the vicinity of the front side wall of the inner case for guiding movement of said blocking member;

projections being provided at the back side of the first switch knob and opposed to the slanting guide surfaces of the blocking member with an appropriate gap therebetween in the normal position, whereby one of said guide projections moves to one of said slanting guide surfaces when one of the push portions is depressed and whereby the blocking member is moved due to reaction movement of the projection so that the projection placed opposite approaches close to the corresponding guide surface to prevent depression of any of the other push portions.

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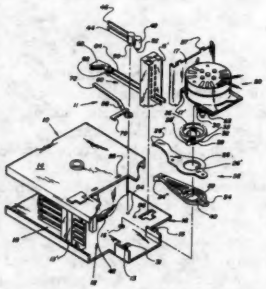
**4,611,103**

## MEANS PROVIDING INTERMITTENT MOTION TO A CAM MEANS OF A TIMING MECHANISM AND HAVING SUB-INTERVAL SWITCHING MEANS

**Robert L. Eder, Indianapolis, and Donald L. Ray, Oaklandon, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.**

**Filed Apr. 11, 1985, Ser. No. 722,115**
**Int. Cl.[4] H01H *7/00***
**U.S. Cl. 200—38 B** **8 Claims**



1. A timing mechanism comprising

(a) motor drive means,

(b) a cam means and electrical switches opening and closing in response to said cam means,

(c) a shaft,

(d) a combination intermittent drive means and sub-interval drive means carried on said shaft including first and second rotating members carried on said shaft, first and second drive pawls coupled to and driven by said first and second rotating members and engaging said cam means to drive same in a reciprocating manner, a sub-interval drive cam carried on said shaft, and a cam follower engaging said sub-interval drive cam, and

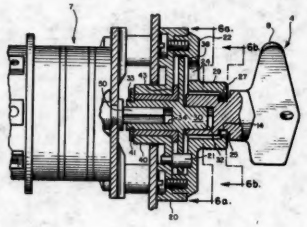
(e) sub-interval switch means biased by said cam follower to open and close said sub-interval switch means.

**4,611,104**

## ELECTROMECHANICAL SWITCH ACTUATOR HAVING HIGH SECURITY KEY ACTUATOR

**Redreddy S. Reddy, Evanston, Ill., assignor to Vapor Corporation, Chicago, Ill.**

**Filed Oct. 4, 1985, Ser. No. 784,486**
**Int. Cl.[4] H01H *27/08***
**U.S. Cl. 200—43.08** **5 Claims**



1. An electromechanical switch actuator, of the type operated by a detachable key, for controlling angular positioning of a component of an electromechanical switch, said actuator comprising:

an actuator housing;

an escutcheon mounted on said housing and defining therewith a cavity, said escutcheon having an indicator face and a generally tubular, open-ended boss extending forwardly of said indicator face; and

a switch stop plate rotatably mounted in said cavity, said plate having a front surface and a rear surface, said plate having a forward shaft extending from said front surface and into said boss and terminating short of the open end of the boss, said plate further having a rear shaft in axial alignment with said forward shaft, said rear shaft projecting from said rear surface and having a cavity for non-rotatably receiving said electromechanical switch component,

said plate front surface having a visually prominent indicating spot and said escutcheon having a plurality of apertures intersecting said indicator face, said spot being aligned to appear in each of said apertures depending on the angular position of said forward shaft whereby said actuator provides visual indication of the angular position of said switch component.

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**4,611,105**

## DEVICE FOR THE MEASUREMENT OF THROUGH-FLOW WITH POTENTIAL-FREE END CONTACT SWITCH

**Klaus Kobold, Sodener Str. 120, D-6233 Kelkheim, Fed. Rep. of Germany**

**Continuation of Ser. No. 494,088, May 12, 1983, abandoned. This application Aug. 8, 1985, Ser. No. 763,632**
**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1982, 8222641[U]**
**Int. Cl.[4] H01H *36/00***
**U.S. Cl. 200—81.9 M** **5 Claims**

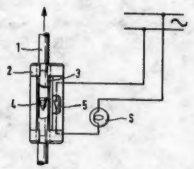
1. A measuring device for the through-flow measurement of gases or liquids according to the float element principle, said device comprising a narrow measuring tube, a float element disposed in said measuring tube, an axially magnetized magnet contained in said float element, and one or more protective gas contact switches disposed laterally adjacent the measuring tube,

wherein the measuring tube (3) has an inner diameter of 3 to 10 mm,

wherein the float element (4) has a diameter length ratio of 1:1 to 1:3 and the magnet (5) contained therein a diameter of 1 to 8 mm, at a diameter-length ratio of 1:1 to 1:3,

wherein the one or more protective gas contact switches (5) are subminiature switches with a glass tube having a diameter of 1 to 3.5 mm and operating sensitivity of 5 to 120 ampere turns and

wherein there is provided a holding devices (7) for said switches, said holding device at least partially surrounding the measuring tube (3) and being in the form of a block of a cube-shaped or parallelopiped-shaped block (7) having a groove (9), and




the one or more protective gas contact switches (5) are disposed in said groove (9), said block (7) having a longitudinal bore (8) for receiving the measuring tube (3), and said groove (9) leading from the longitudinal bore (8), in such a way that the one or more switches are immediately contiguous to the measuring tube (3),

whereby the through-flow measurement of very small quantities of gases or liquids is made possible.

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**4,611,106**

## CIRCUIT BREAKER CONTACT STRUCTURE

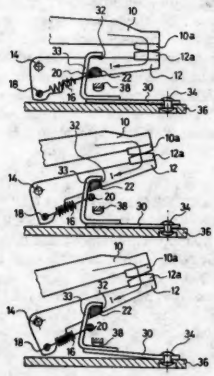
**Franco P. Pardini, Milan, and Claudio Banfi, Rovello Porro, both of Italy, assignors to General Electric Company, New York, N.Y.**

**Filed May 7, 1984, Ser. No. 607,866**

**Claims priority, application Italy, May 9, 1983, 209992 A/83; Feb. 2, 1984, 20721/84[U]**

**Int. Cl.[4] H01H *33/18***

**U.S. Cl. 200—147 R** **7 Claims**




1. A contact arrangement for electrical circuit breakers comprising:

a pair of first and second contacts attached to one end of corresponding first and second movable contact arms;

a first spring associated with said first movable contact arm for biasing said first movable contact arm in a first direction and holding said second contact against said first contact; and

second spring attached to a support structure and having a first end proximate a first stop on said first movable contact arm, for engaging said first stop when said first and second movable contact arms move together in said first direction to prevent said first and second contacts from becoming separated.

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**4,611,107**

## PRECISION TW ELECTROEROSION WITH SUPERIMPOSED MULTIPLE OPENING GUIDES

**Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan**

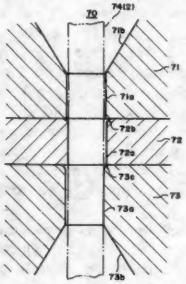
**Filed Jun. 25, 1984, Ser. No. 623,998**

**Claims priority, application Japan, Jun. 25, 1983, 58-114702; Sep. 29, 1983, 58-181234; Oct. 18, 1983, 58-194952**

**The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.**

**Int. Cl.[4] B23H *7/10***

**U.S. Cl. 219—69 W** **4 Claims**




1. An apparatus for electroerosively cutting an electrically conductive workpiece with a continuous electrode wire, comprising:

means for axially transporting an electrode wire through a workpiece while defining a cutting zone therewith flushed with a cutting liquid medium;

a pair of wire guide means disposed at opposite sides of the workpiece for providing a straight-line path for the traveling electrode wire therebetween;

power supply means for electrically energizing said cutting zone to erosively remove material from the workpiece; and

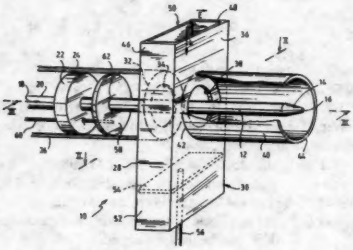
cutting feed means for relatively displacing the workpiece and the traveling electrode wire transversely along a programmed cutting path to advance the erosive material removal in the workpiece, wherein at least one of said wire guide means comprises:

a plurality of guide elements arranged in the direction of travel of the electrode wire and having respective circular wire-receptive guide openings each of which has a diameter substantially greater than a nominal diameter of the electrode wire, said elements being disposed eccentrically with respect to one another to form a composite opening such that an imaginary cylinder which can be inscribed therein has a diameter which is substantially equal to the nominal diameter of the electrode wire.

## 4,611,108
## PLASMA TORCHES

**Philippe Leprince; Emile Bloyet, both of Gif sur Yvette, and Jean Marec, Limours, all of France, assignors to Agence National de Valorisation de la Recherche (ANUAR), Paris, France**

**Filed Sep. 12, 1983, Ser. No. 531,346**
**Claims priority, application France, Sep. 16, 1982, 82 15682**
**Int. Cl.⁴ B23K *9/00***
**U.S. Cl. 219—121 PR** **24 Claims**



1. A plasma torch of the type comprising means for supplying microwave energy, gas delivery means comprising at least one tube for the flow of gas having an end portion which is electrically conductive at least to a partial extent and provided with a gas discharge outlet, and means providing a coupling between said microwave energy supply means and said tube, wherein said microwave energy supply means comprises a waveguide having a microwave input end, walls and a terminal short-circuit opposed to the microwave input end, and

said coupling means comprises first and second openings made within said walls of the waveguide,

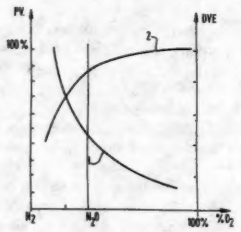
said end portion of the tube passing through said two openings, and

the first one of said openings being located on the side nearest the gas discharge outlet having a dimension larger than the transverse dimension of the tube.

## 4,611,109
## GAS AND PROCESS FOR PLASMA ARC CUTTING

**Jean-Pierre Larue, Osny; Georges Duboz, Paris; Claude Carsac, Saint-Leu-La-Foret, and Gérard Marhic, Cergy, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France**

**Filed Mar. 5, 1985, Ser. No. 708,516**
**Claims priority, application France, Mar. 16, 1984, 84 04046**
**Int. Cl.⁴ B23K *15/00***
**U.S. Cl. 219—121 PY** **10 Claims**

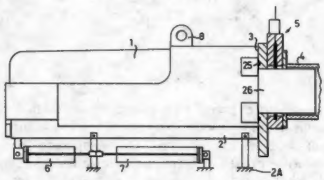



1. In a method of plasma arc cutting of an electrically conductive material using a plasma-producing gas, the improvement wherein said plasma-producing gas comprises a compound of the elements nitrogen and oxygen in an amount sufficient to reduce electrode destruction.

## 4,611,110
## METHOD AND APPARATUS FOR CONNECTING A PLASMA GENERATOR TO A REACTOR

**Gunnar Astner; Örjan Wstergren, and Jan Thörnblom, all of Hofors, Sweden, assignors to SKF Steel Enginering AB, Hofors, Sweden**

**Filed Mar. 30, 1984, Ser. No. 595,295**
**Claims priority, application Sweden, Sep. 1, 1983, 8304722**
**Int. Cl.⁴ B23K *9/00***
**U.S. Cl. 219—121 PY** **25 Claims**



1. In a method for connecting a plasma generator to a reactor which includes a selectively engageable electrical connection of the plasma generator to a return conductor to a current source, the improvement comprising the steps of:

(a) introducing the plasma generator to an intermediate position in which it is positioned in the tuyere of the reactor and at least partially seals the reactor, while maintaining closed a remote-control valve which seals the reactor from the surroundings when the plasma generator is fully withdrawn;

(b) opening said valve once the plasma generator is in its said intermediate sealing position;

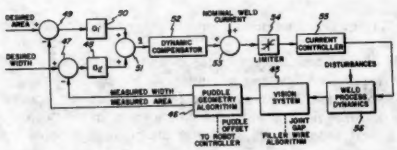
(c) moving the plasma generator from said intermediate sealing position to a fully installed operating position, said movement of the plasma generator to said operating position simultaneously automatically engaging first electrical contact means on the plasma generator with stationary second electrical contact means; and

(d) operating remote-controlled locking means which both press the plasma generator against the reactor and lock it thereagainst, and simultaneously automatically engage said electrical connection of the plasma generator to the return conductor to the current source.

## 4,611,111
## METHOD TO DETERMINE WELD PUDDLE AREA AND WIDTH FROM VISION MEASUREMENTS

**Radhakisan S. Baheti, Schenectady, and Nelson R. Corby, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jan. 22, 1985, Ser. No. 693,545**
**Int. Cl.⁴ B23K *9/12***
**U.S. Cl. 219—124.34** **10 Claims**




1. In a robotic welding operation wherein welding current conducted by the nonconsumable electrode of a welding torch

generates an electric arc whose heat forms a molten weld puddle in the workpiece, and a vision system integrated with said torch provides images of said weld puddle to control the welding process, the improved method of measuring puddle geometry parameters comprising:

sampling image intensities along N radial rays intersecting only the trailing edge of said weld puddle, using the torch electrode as the origin;

determining pudlde boundary point data by processing each radial image intensity waveform to identify patterns that indicate potential edge points;

prefiltering the puddle boundary data to remove extraneous points;

estimating in real time by means of a least-squares algorithm the area and maximum width of the elliptical weld puddle; and

passing these values to a closed-loop weld process control system.

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**4,611,112**

## ELECTRIC HOTPLATE

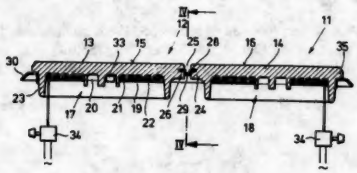
**Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to EGO Elektro-Geräte Blanc und Fischer, Fed. Rep. of Germany**

**Filed Oct. 5, 1984, Ser. No. 658,429**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336311**

**Int. Cl.[4] H05B *3/68***

**U.S. Cl. 219—455** **8 Claims**




1. An electic hotplate, comprising:

a hotplate body made from cast material and heating means for the hotplate body, the hotplate body having an upper, substantially flat cooking surface, the heating means comprising two juxtaposed, spaced, separately heatable heating zones for a common substantially-flat cooking surface of the hotplate body, the cooking surface being of an elongated shape, the hotplate body comprising an intermediate area between the heating zones, each heating zone having electrical heating resistors embedded by insulating material in spiral grooves in a bottom surface of the hotplate body and each heating zone having its own control means and an individual thermal cut-out means, and wherein the two heating zones define left and right parts of a similar shape and construction, the intermediate area being of relatively thick cast material in comparison to adjacent regions of the hotplate body.

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**4,611,113**

## HEAT STRESS CALCULATOR

**David K. Halstead, 2605 Klingle Rd., NW., Washington, D.C. 20008**

**Filed Jan. 25, 1985, Ser. No. 695,221**

**Int. Cl.[4] G06C *27/00***

**U.S. Cl. 235—78 R** **8 Claims**

1. A heat stress calculator for determining human heat stress or thermal discomfort reported as an equivalent temperature for any given summer air temperature, relative humidity, wind velocity, sky condition, time-of-day, terrain, and individual physical activity level, said calculator comprising in combination:

a stationary body front panel of square form having a central axis base and circular notched left edge and including:

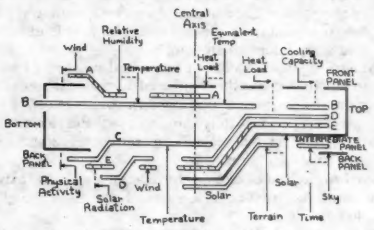
(a) a cut out section of arcuate form, centrally positioned in the lower half, having inscribed immediately adjacent to the outer cicumference thereof, a 2nd input wind velocity scale;

(b) a transparent or cut out center window of rectangular form, centrally positioned in the upper half, having inscribed immediately adjacent to the left side thereof, a referred heat load scale, and further inscribed at the top left corner thereof a equivalent temperature arrow;

(c) a transparent or cut out left window of rectangular form, positioned diagonally to the left of center in the upper half, having inscribed immediately adjacent and central to the lower edge thereof, a heat load arrow;

(d) a transparent or cut out right window of rectangular form, positioned diagonally to the right of center in the upper half, having inscribed immediately adjacent and central to the lower edge thereof, a cooling capacity arrow;

a stationary body back panel of square form and circular notched right edge integral to the said body front panel at the bottom and folded along the common line against the said front panel, and including a centrally positioned transparent or cut out section of interruped circular form of two radii, the discontinuity forming a left and right physical activity stop, and having inscribed immediately adjacent to the lower circumference thereof, a physical activity scale, and having further inscribed immediately




adjacent to the upper circumference thereof, space a sky scale;

a stationary body intermediate panel of substantially triangular form integral to the said body front panel at the top and folded along the common line against the front panel, having a central axis base and having inscribed a centrally positioned circular solar heat load scale;

a first disc element of essentially circular form having a central axis and mounted for rotation movement immediately below said body back panel and including:

(a) an inscribed grid of 1st input wind velocity versus convective cooling capacity circumference with 1st input temperature line overlay, in operative registration with a physical activity arrow inscribed immediately adjacent to the outer circumference;

(b) a physical activity tab with side stops in operative registration with counterpart said stops on said body rear panel; said physical activity tab extends above said body back panel;

a second disc element of circular form having a central axis and mounted for rotation movement immediately above said first disc with the top half located below said body intermediate panel and the bottom half located above said body back panel, and including:

(a) an inscribed circular body evaporative heat load requirement scale located inwardly of the outside circumference and positioned to be read from said left window of said body front panel, and in operative registration, a solar heat gain arrow inscribed on a solar tab, the said

solar tab folded over to position said radiation arrow on the reverse side of said second disc element;

(b) a transparent or cut out window of arcuate form to permit visual display of said first input temperature line overlay of said first disc element;

(c) an extended circumference section in operative registration with said stops on a stationary body back panel, to limit rotation of said third disc;

a third disc element of circular form having a central axis and mounted for rotation immediately above said second disc with the top half located immediately below said body intermediate panel and including:

(a) a transparent or cut out perpendicular window of rectangular form positioned to read said first input temperature line overlay of said first disc, and having inscribed immediately adjacent to the left edge thereof, a 1st input wind velocity scale, and further inscribed at the top left corner thereof, a 1st input temperature arrow;

(b) a cut out solar slot of arcuate form having inscribed immediately adjacent to the inner circumference, a referred solar heat gain scale in operative registration with said first input temperature arrow. The said solar tab of said second rotating disk extends through said solar slot;

a fourth disc element of substantially rhombic form having a central axis located in the lower quadrant, and mounted for rotation movement between the upper halves of said body back panel and body intermediate panel and including:

(a) a circular inscribed time-of-day scale located inwardly of the outside circumference and in operative registration with said sky scale and said solar heat load scale on said body intermediate panel;

(b) a transparent or cut out horizontal window of rectangular form centrally positioned to read said solar heat gain scale on said body intermediate panel, having inscribed immediately adjacent to the lower edge thereof, a terrain scale in operative registration with said solar heat gain scale;

a fifth disc element of circular form having a central axis and mounted for rotation below said body front panel and including:

(a) an inscribed circular environment evaporative cooling capacity scale located inwardly of the outside circumference and positioned to be read from said right window of said body front panel, in operative registration with;

(b) an inscribed grid of linear scaled relative humidity radius and environment evaporative cooling rate circumference with 2nd input temperature line overlay;

(c) an inscribed grid of body evaporative heat load radius versus environment evaporative cooling capacity circumference with equivalent temperature line overlay positioned to be read from said central window of said body front panel;

(d) a cut out slot of arcuate form to permit visual display of the said body evaporative heat load requirement scale on said second disc;

a sixth disc element of essentially circular form having a central axis and mounted for rotation between said fifth disc element and said body front panel and including:

(a) a transparent or cut out perpendicular window of rectangular form centrally positioned in the lower half to read said 2nd input temperatue line overlay, having inscribed immediately adjacent to the left side thereof, a linear relative humidity scale, and further inscribed at the top left corner thereof a 2nd input temperature arrow;

(b) a wind arrow centrally located below and in operative registration with said perpendicular window and inscribed immediately adjacent to the outer circumference;

whereby the positioning of a selected one of said time-of-day values by a selected one of said sky conditions will operatively locate said solar heat load scale adjacent said terrain scale so as to display the correct solar radiation heat gain opposite a selected one of said terrain conditions; and, whereby the positioning of said solar radiation arrow by said correct solar radiation heat gain on said referred solar heat gain scale, and the positioning of said physical activity arrow by a selected one of said physical activity levels, and the positioning of a selected one of said wind velocity values by a selected one of adjacent said 1st input temperature lines at said 1st input temperature arrow, will operatively locate said body evaporative heat load requirement scale so as to display the correct heat load rate opposite said heat load arrow; and, whereby the positioning of said wind velocity arrow by a selected one of said wind velocity values, and the positioning of a selected one of said relative humidity values by a selected one of adjacent said 2nd input temperature lines at said 2nd input temperature arrow, will operatively locate said environment evaporative cooling capacity scale so as to display the correct cooling capacity rate opposite said cooling capacity arrow, and will operatively locate said equivalent temperature line overlay so as to display the correct equivalent temperature line opposite said correct heat load rate on said referred heat load scale at said equivalent temperature arrow.

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**4,611,114**

## PHOTOELECTRIC DETECTION STRUCTURE HAVING SUBSTRATE WITH CONTROLLED PROPERTIES

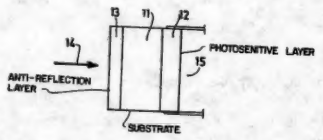
**Pierre Dolizy, Ris-Orangis; Francoise Groliere, Nogent-sur-Marne, and Francois Maniguet, Fontenay-Tresigny, all of France, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 439,461, Nov. 5, 1982, abandoned. This application Oct. 4, 1985, Ser. No. 785,087**

**Claims priority, application France, Nov. 13, 1981, 81 21249**

**Int. Cl.[4] H01J *40/14***

**U.S. Cl. 250—211 R** **12 Claims**




1. A photoelectric detection structure comprising

a substrate transparent to incident radiation in the visible and near infra-red radiation range, said substrate being lathanum glass, barium glass, or titanium glass with a refractive index of at most 2, and said substrate being of a shape to limit an angle of incidence of a radiation beam to at most 20°,

means for reducing reflection at a first surface of said substrate in the direction of incidence of said radiation beam, and

a photosensitive layer at a second opposite surface of said substrate.

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**4,611,115**

## LASER ETCH MONITORING SYSTEM

**Theodore C. Rich, Berkeley Heights, N.J., assignor to Richland Glass Company, Inc., Richland, N.J.**

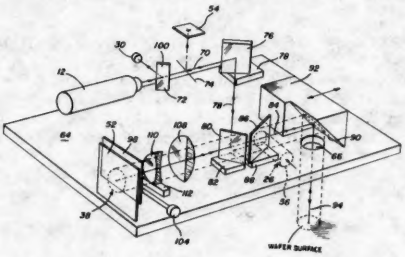
**Filed Jan. 14, 1985, Ser. No. 690,868**

**Int. Cl.[4] H01J *3/14;* G02B *23/00***

**U.S. Cl. 250—216** **12 Claims**

1. In combination with a device for generating a laser beam, an optical system for directing said laser beam along an optical path onto a target, means connected to the optical system for focusing the laser beam at selected end points of the optical path on the target, a source of illumination and means for directing the illumination from said source along the optical

path of the laser beam onto the target, the improvement including scan control means connected to the optical system for displacing said laser beam between said end points on the target, an image display screen, means for projecting the illumination reflected from the target onto the display screen, means for focusing images of the target formed by the projected illumination on the display screen and a housing enclosing the optical system and mounting the display screen, the scan control means and the focusing means.



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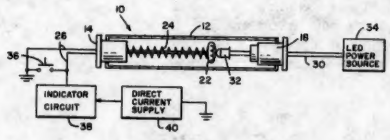
## 4,611,116
## LIGHT EMITTING DIODE INTENSITY TESTER

James E. Batt, 292 Jomar Rd., Ardmore, Ala. 35739

Filed Feb. 21, 1984, Ser. No. 582,209
Int. Cl.[4] H01J *5/02*
U.S. Cl. 250—239 3 Claims




1. In a system for measuring pulses of electromagnetic radiation wherein detected radiation is indicated on a meter and is indicative of the strength of the detected radiation, the improvement of a radiation containment assembly comprising; a radiation containment housing containing a chamber open at first and second ends, first and second plugs for closing respective ends of said chamber, optical detector means supported by said first plug within the chamber, electrical wires coupled to said detector and passing through the first plug for coupling a signal output from said housing in response to optical stimulation of said detector means, said second plug having electrical wires passing therethrough for coupling an electrical signal input to said plug, said second plug being disposed for receiving and positioning an electromagnetic radiation emitter within said chamber, said first and second plugs provide for physical contact between said photocell and said radiation emitter within said chamber, a spring disposed on said second plug for holding said detector, whereby said optical detector is spring loaded within said chamber for allowing variable positioning of said detector within the chamber.

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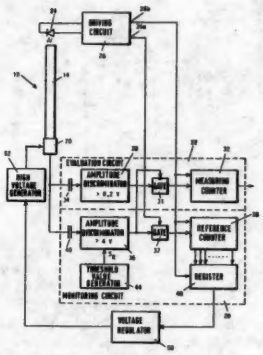
## 4,611,117
## METHOD AND ARRANGEMENT FOR THE AUTOMATIC STABILIZATION OF A SCINTILLATION DETECTOR

Frank Seibert, Rheinfelden, and Gustav Wetzel, Lörrach, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,816
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328256
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—252.1 27 Claims




1. A method of stabilizing a scintillation detector having a photoelectric transducer for generator output pulses when stimulated by radiation comprising the steps of generating periodic light pulses with a predetermined recurrence period, modulating the intensity of successive light pulses in a modulation interval extending between a minimum intensity and a maximum intensity in accordance with a periodic sawtooth function having a modulation period which is large compared with the recurrence period of the light pulses, superimposing said modulated light pulses on radiation to be measured so that said light pulses are intercepted by the photoelectric transducer of said scintillation detector and converted into periodic electrical reference pulses having the same recurrence period as said light pulses, said reference pulses being pulse amplitude modulated in accordance with said sawtooth function in the modulation interval, determining in each modulation period the number of reference pulses whose amplitudes exceed a predetermined reference threshold value lying in said modulation interval, and using said number for stabilizing said scintillation detector.

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## 4,611,118
## TIME-OF-FLIGHT ION MASS ANALYZER

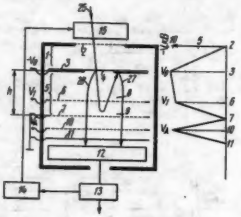
Georgy G. Managadze, Moscow, U.S.S.R., assignor to Institut Kosmicheskish Issledovany Akademi Nauk SSS, Moscow, U.S.S.R.

Filed Jul. 18, 1984, Ser. No. 631,850
Claims priority, application U.S.S.R., Aug. 16, 1983, 3641102; Feb. 16, 1984, 3702216
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—287 5 Claims

1. A time-of-flight ion mass analyzer comprising:
(a) a casing;
(b) a device for preaccelerating ions being analyzed, located in said casing of the time-of-flight ion mass analyzer;
(c) sensing member means of the ion mass analyzer for detecting a moment at which an ion enters a time-of-flight space, said sensing member means being located downstream from said preacceleration device in said casing of

the ion mass analyzer and in a path of movement of said ions;

(d) a reflector positioned downstream from said sensing member means in said casing of the ion mass analyzer and having at least two grid electrodes, a first intermediate grid electrode located downstream from said sensing member means, and receiving a voltage potential from a voltage source, and forming at least two zones in said reflector, a first zone having a different electrical field potential gradient relative to an electrical field potential gradient of a second zone, and a second bottom grid electrode positioned downstream from said first intermediate grid electrode in the ion mass analyzer and receiving a voltage potential from said voltage source and providing a potential difference between said bottom grid electrode and said sensing member means, said potential difference being defined as an absolute value which is at least equal to, a potential difference at said preacceleration device;



(e) an electron detector located downstream from said casing of the reflector in the ion mass analyzer; and

(f) a time interval measurement device located downstream from said electron detector outside said casing of the ion mass analyzer and having an input connected to an output of said electron detector.

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**4,611,119**

## METHOD OF EMPHASIZING A SUBJECT AREA IN A SCANNING MICROSCOPE

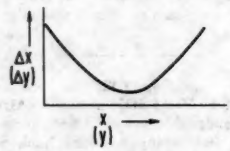
**Peter Fazekas, Munich, and Johann Otto, Bad Tölz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 4, 1983, Ser. No. 520,461**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235727**

**Int. Cl.[4] G01N *23/00***

**U.S. Cl. 250—307** **2 Claims**




1. In a method of scanning an area of a subject with a scanning microscope, said method including the steps of conducting a particle probe of the scanning microscope over the subject in a line-by-line manner with a given scanning speed along each line and a given spacing between the lines, and reproducing the image on an image recording device in a line-by-line manner by utilizing a given scanning speed along each image line and a given spacing between the image lines with the improvement comprising in the step of conducting a particle probe, continuously varying the scanning speed along each line of the particle probe and continuously varying the spacing between the lines during the scanning of each line while maintaining the scanning speed and spacing between lines constant at the image recording device so that the recorded image contains a magnified portion of an area of the subject with a greater magnification than the image of the portions surrounding the magnified portions.

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**4,611,120**

## SUPPRESSION OF MOLECULAR IONS IN SECONDARY ION MASS SPECTRA

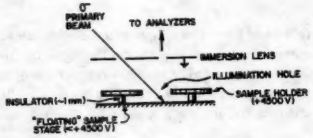
**G. Michael Bancroft, 62 Heathcote Avenue, London, Ontario, Canada (N6G 1V5); William J. Chauvin, 10 Sandalwood Crescent, London, Ontario, Canada N6G 2Z7; Norman S. McIn-2P3), and James B. Metson, 310 Oxford Street East, London, Ontario, Canada N6A 1V5**

**Filed Sep. 7, 1984, Ser. No. 648,727**

**Claims priority, application Canada, Oct. 28, 1983, 439946**

**Int. Cl.[4] G01N *23/00***

**U.S. Cl. 250—307** **14 Claims**




1. A method of suppressing molecular ions in the secondary ion mass spectra of a solid specimen of insulating or semiconducting material and removing charge distortions from the spectra of insulating materials, said method comprising the steps of:

mounting said specimen of insulating or semiconducting material uncoated in a specimen holder such that said specimen is isolated electrically and offset behind the stage of a secondary ion microscope/mass analyzer;

securing a mask above said specimen, said mask being attached electrically to said stage;

impinging on said speciment a high energy primary ion beam to produce secondary ions;

charging said specimen such that a potential difference in excess of 300 V exists between the surface of said specimen and said mask;

focussing said secondary ions through an immersion lens into an analyzer;

recording the secondary ion mass spectra of said specimen.

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**4,611,121**

## MAGNET APPARATUS

**Masao Miyamura, Fujisawa; Osamu Tsukakoshi, Hiratsuka; Yoshio Kamata, Yokohama, and Shoji Aiba, Nagoya, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki and Daido Tokushuko Kabushiki Kaisha, Nagoya, both of, Japan**

**Filed Apr. 18, 1984, Ser. No. 601,410**

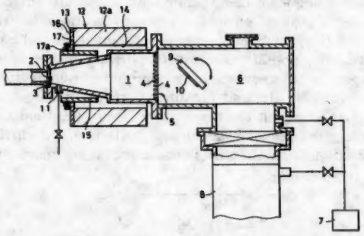
**Claims priority, application Japan, Apr. 19, 1983, 58-67865**

**Int. Cl.[4] H01J *27/16***

**U.S. Cl. 250—423 R** **8 Claims**

1. A permanent magnet apparatus for an ion source providing a magnetic field having a gradient in an operating chamber into which microwaves are introduced comprising a cylindrical permanent magnet having open ends and surrounding the outer walls of an operating chamber having a hollow interior and an open inlet end and an open outlet end, and a subsidiary yoke at one of the ends of said cylindrical magnet, the subsidiary yoke having a cylindrical portion extending into but not completely contained with said cylindrical magnet at said inlet end of said operating chamber and toward said outlet end substantially one half the length of said cylindrical magnet and in axial alignment with the axis of said cylindrical magnet and said operating chamber and intermediate said cylindrical mag-

net and said operating chamber, the outer diameter of said yoke being smaller than the inner diameter of said cylindrical



magnet and means at the operating chamber inlet end of said cylindrical magnet for supporting said yoke.

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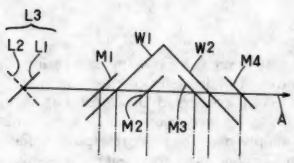
**4,611,122**

## SIGNAL DETECTION APPARATUS WITH PLURAL ELONGATE BEAMS CORRESPONDING

**Shigeki Nakano, Tokyo, and Masao Totsuka, Ohmiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 23, 1983, Ser. No. 554,630**
**Claims priority, application Japan, Nov. 29, 1982, 57-208764**
**Int. Cl.[4] G01N *21/86***
**U.S. Cl. 250—548** **15 Claims**



1. An apparatus for detecting light signals from first and second marks extending in different directions on an object, the apparatus comprising:

means for forming, with beams having different properties, illumination areas extending in different directions corresponding to the different directions in which the marks extend;

means for illuminating the first and second marks with both of the illumination areas; and

means for separately receiving components of light from the marks on the basis of the difference in the properties of the beams.

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**4,611,123**

## HIGH VOLTAGE ANALOG SOLID STATE SWITCH

**Duncan R. McDonald, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, San Jose, Calif.**

**Filed Dec. 23, 1982, Ser. No. 452,607**
**Int. Cl.[4] G02B *27/00***
**U.S. Cl. 250—551** **7 Claims**

1. A switch for selectively connecting an input node to an output node comprising:

a first source of a first signal;

a second source of a second signal;

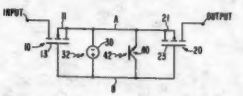
first and second MOS transistors each having gate, source and drain electrodes, the input node being connected to the drain of the first transistor and the output node being connected to the drain of the second transistor, the gates of the transistors being connected to a first node, and the sources of the transistors being connected to a second node;

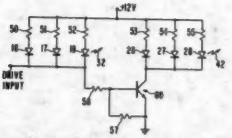
photovoltaic generating means connected between the first node and the second node for generating a potential difference therebetween in response to the first signal;

a photosensitive bipolar transistor having an emitter and a collector coupled between the first node and the second node, the photosensitive bipolar transistor for electrically shorting the first node to the second node in response to the second signal;

first and second potential sources;

a control bipolar transistor having a base coupled to receive a control signal, a collector and an emitter;





wherein the first source is connected between the potential source and the base of the control bipolar transistor;

the second source is connected between the first potential source and the collector of the control bipolar transistor;

the emitter of the control bipolar transistor is connected to the second potential source; and

whereby when the control signal is of a first level the first source is turned on and the second source is turned off, and when the control signal is of a second level the first source is turned off and the second source is turned on.

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**4,611,124**

## FLY'S EYE SENSOR NONLINEAR SIGNAL PROCESSING

**Richard T. Schneider, Gainesville, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jun. 13, 1984, Ser. No. 620,211**
**Int. Cl.[4] H01J *40/14***
**U.S. Cl. 250—578** **15 Claims**

1. Fly eye detector apparatus comprising the combination of:

N apertured optical lens means for coupling transducer elements with a viewed scene, N being a first predetermined integral number greater than 1:

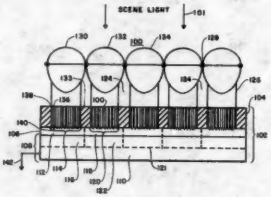
optical to electrical retina means including an N plurality of solid state transducer cells each coupled with one of said N apertures and each containing an M plurality of transducer elements, M being a second predetermined integral number greater than 1, said cells of elements being located in the focal plane of said optical lens means for generating optically determined electrical signals;

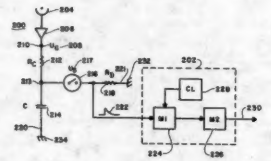
logarithmic electrical signal correlation means of at least M×N number of signal channels and located adjacent said transducer elements for converting said transducer electrical signals to electrical pulse signals, each channel of said signal correlating means including:

electrical storage circuit means for logarithmically accumulating one of said transducer element electrical signals, said storage circuit means including a capacitor element

and a charging current first electrical resistance element series connected therewith, the electrical sizes of said capacitor and charging current first resistance element being related according to a predetermined first electrical time constant;

electrical switch means closable in response to attainment of a predetermined voltage across said capacitor element for discharging said capacitor element;



a second electrical resistance element connected in series with said switch means and capacitor element for generating a capacitor discharge pulse signal, the electrical size of said capacitor and said second resistance element being related according to a second electrical time constant;

means for counting the number of said capacitor discharge pulses occurring during a predetermined time interval.

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**4,611,125**

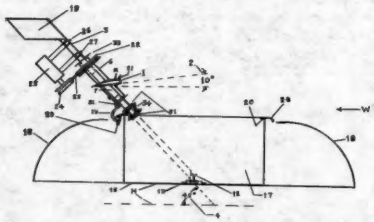
**POWER POTENTIATING WINDMILL**

**Paul R. Stone, Jr., 1901 Huber Rd., Charleston, W. Va. 25314**

**Filed Jan. 31, 1984, Ser. No. 575,410**

**Int. Cl.[4] F03D *1/06***

**U.S. Cl. 290—55** **16 Claims**



1. A method of taking advantage of the Bernoulli Principle to [illegible] airfoil, comprising the steps of mounting airfoil means [illegible]ollar means for rotation about axle means when disposed in a moving fluid medium, the direction of motion of the moving fluid defining a "fluid medium direction", said airfoil means comprising airfoil blade means having an aeronautical type cross section design and comprising at least one airfoil blade, the blade including a top and a bottom and leading and trailing edges, the airfoil blade means disposed within the moving fluid medium in a manner that the leading edge of the airfoil blade, during a portion of its rotation, advances opposite and at an angle of attack with respect to the fluid medium direction, the bottom of the airfoil blade and its trailing edge, during a portion of its rotation, moving cross-wise to the fluid medium direction, and during another portion of its rotation, the bottom, continuing to receive the force of motion of the fluid medium, moving with and in the fluid medium direction, the axle means being slanted at a backward angle in the fluid medium direction in a manner so as to permit the motion of the fluid medium to exert a substantial lift and continuing thrust reaction at the top of the airfoil adjacent to its leading edge to take advantage of the Bernoulli Principle for a portion of the blade arc, and for other portions of the arc of rotation, so as to permit the force of motion of the fluid medium to exert rotational force on the bottom of the airfoil blade, and connecting the airfoil blade means to means for providing power.

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**4,611,126**

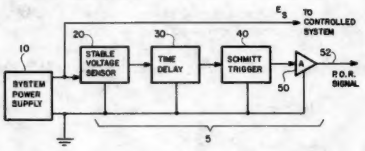
**POWER ON/OFF RESET GENERATOR**

**Peter A. Miller, Orlando, Fla., assignor to Werkzeugmaschinenfabrik Oerlikon-Buehrle AG, Zurich, Switzerland**

**Filed Oct. 4, 1984, Ser. No. 657,557**

**Int. Cl.[4] H02J *7/00***

**U.S. Cl. 307—64** **12 Claims**




1. A power on-off reset generator for monitoring a power supply for a controlled logic system comprising:

voltage sensor means connected in parallel with said power supply for producing an output signal when the voltage of said power supply rises above a preselected value;

time delay means connected to receive the output signal from said voltage sensor means for producing a delay signal of a preselected duration;

trigger circuit means connected to said time delay means and responsive to the termination of said delay signal for producing a bounce-free enabling logic level reset signal, said trigger circuit producing a disabling logic level signal when said power supply voltage is less than said preselected value; and

output driver means associated with said trigger circuit for furnishing said enabling signal and said disabling signal in a power fail-safe manner to said controlled logic system,

each of said voltage sensor means, time delay means, trigger circuit means, and output driver means employing saturation mode circuit design principle and operating from the same power supply being monitored, and performing properly under a range of normal and subnormal power supply conditions, said range of power supply conditions for proper operation spanning from the selected nominal operating voltage of said power supply, down to 1.0 volts guaranteed, 0.7 volts typical.

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**4,611,127**

**ELECTRONIC SENSOR FOR STATIC MAGNETIC FIELD**

**Ibrahim H. Ibrahim, North Ryde, and Christopher N. Daly, Bilgola Plateau, both of Australia, assignors to Telectronics N.V., Curacao, Netherlands Antilles**

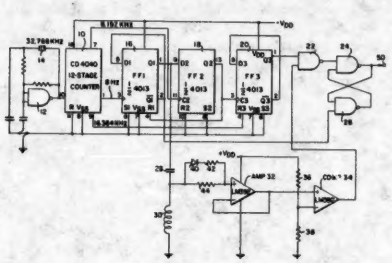
**Filed Sep. 20, 1984, Ser. No. 652,510**

**Int. Cl.[4] H01H *35/00***

**U.S. Cl. 307—116** **9 Claims**

1. A magnetic field sensor comprising a resonant circuit including a coil and whose resonant frequency varies with the strength of a magnetic field which passes through the coil, means for applying an energizing signal to said resonant circuit

for a predetermined time interval, means for defining a sensing window which begins following the cessation of said energizing signal and ends at a predetermined time thereafter, and



means for detecting whether the signal level at a selected point in the resonant circuit crosses a threshold level during said sensing window.

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**4,611,128**

## TRIAC HAVING A MULTILAYER SEMICONDUCTOR BODY

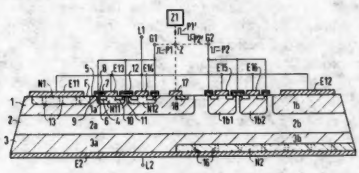
**Hubert Patalong, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 22, 1980, Ser. No. 199,519**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945380**

**Int. Cl.[4] H03K** *17/60*

**U.S. Cl. 307—252 B** **10 Claims**



**1.** In a triac of the type in which a multilayer semiconductor body is arranged between first and second electrodes, in which there is a first thyristor and a second thyristor, a first, p-conductivity layer forms a base of the first thyristor and an emitter of the second thyristor, in which a second, n-conductivity layer forms bases for both thyristors, in which a third, p-conductivity layer forms an emitter of the first thyristor and a base of the second thyristor, in which a fourth, n-conductivity layer of the first thyristor is located in the first layer and contacts the first electrode, and in which a fifth, n-conductivity layer is located in the third layer and contacts the second electrode, the improvement therein comprising:

an n-conductivity emitter region in the first layer adjacent and laterally spaced from the fourth layer in the direction of the second thyristor;

a p-conductivity emitter region in the second layer laterally spaced from the first layer in the direction of the first thyristor;

emitter electrodes contacting respective emitter regions; and

gate-controlled metal-insulator-semiconductor structures at each of said n-conductivity and p-conductivity emitter regions, including gate-controlled short circuit paths,

said short circuit paths bridging the pn junctions between said n-conductivity emitter region and said first layer and said p-conductivity emitter region and said second layer, respectively.

**4,611,129**

## SIGNAL CONVERSION CIRCUIT

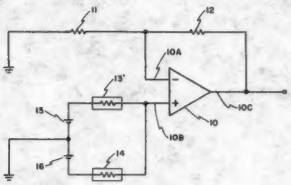
**Tsutomu Ishihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Apr. 23, 1984, Ser. No. 603,113**

**Claims priority, application Japan, Apr. 22, 1983, 58-71067; Apr. 22, 1983, 58-71068**

**Int. Cl.[4] H04R** *3/00;* **H01C** *7/06*

**U.S. Cl. 307—308** **14 Claims**



**1.** A signal conversion circuit for converting a resistance into an electric signal, the circuit comprising:

an operational amplifier having inverted and non-inverted input terminals, and an output terminal;

a first voltage source;

feedback resistor means connected between said inverted input terminal and said output terminal; and

sensing means connected between said first voltage source and said non-inverted input terminal, said sensing means including two sensing elements connected in parallel with each other and having resistance characteristics which are reverse to each other, said resistances being responsive to a condition of an object which is to be detected.

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**4,611,130**

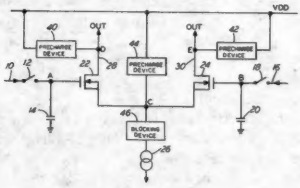
## FLOATING INPUT COMPARATOR WITH PRECHARGING OF INPUT PARASITIC CAPACITORS

**Eric J. Swanson, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Feb. 13, 1984, Ser. No. 579,772**

**Int. Cl.[4] H03K** *5/24, 17/16*

**U.S. Cl. 307—355** **11 Claims**



**1.** A floating input comparator for receiving a pair of input signals along a pair of associated input lines and producing as an output a pair of differential output signals along a pair of output lines, said floating input comparator comprising

a pair of storage means, each storage means of said pair of storage means switchably connected to a separate one of said pair of input lines and capable of storing a separate one of said pair of input signals;

a pair of differential amplifying devices, each amplifying device of said pair of amplifying devices connected between a separate one of said pair of storage means and a separate one of said pair of output lines, said pair of differential amplifying devices for producing as an output said pair of differential output signals;

a bias current source connected to each each differential amplifying device of said pair of differential amplifying devices at a common node;

a plurality of parasitic capacitors associated with each storage means of said pair of storage means; and

precharging means coupled between a predetermined reference potential and each output line of said pair of output lines and also coupled between said predetermined reference potential and said common node, for precharging said pair of output lines and said common node to said predetermined reference potential prior to the production of said pair of differential output signals by said pair of differential amplifying means.

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**4,611,131**

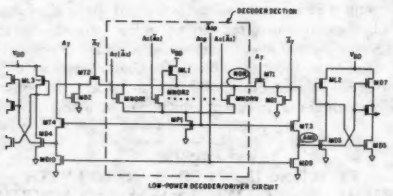
**LOW POWER DECODER-DRIVER CIRCUIT**

**Ashwin H. Shah, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 31, 1983, Ser. No. 528,372**

**Int. Cl.[4] H03K *19/094, 19/20;* G11C *8/00***

**U.S. Cl. 307—449** **8 Claims**




1. A decoder circuit comprising:

(a) a NOR gate, said NOR gate comprising a plurality of transistors, each transistor having a pair of source/drain electrodes and a gate, said source and drain electrodes respectively being commonly connected, said gates of said transistors being connected to receive a combination of true and complemented address bits defining an address for said NOR gate, said NOR gate including output terminal means coupled to one of said commonly connected electrodes;

(b) a first voltage source;

(c) a load device connected to said output terminal means of said NOR gate and said first voltage source;

(d) a reference voltage source;

(e) power-up transistor means connected to the other of said commonly connected electrodes of said NOR gate and said reference source;

(f) said output terminal means of said NOR gate being operatively connected to provide "select" and "deselect" outputs in accordance with said signals applied to said address bits and said power-up transistor means, said first voltage source being closer to said "select" then to said "deselect" voltage, and said reference voltage source being closer to said "deselect" voltage than to said "select" voltage; and

(g) driver circuit means having an output terminal, said driver circuit means being operatively connected to said output terminal means, said driver circuit means comprising power-down transistor means having a gate connected to a complement of the gate of said power-up transistor means, said power-down transistor means being connected to said output terminal means of said NOR gate and said output of said driver circuit.

**4,611,132**

**CIRCUIT UTILIZING JOSEPHSON EFFECT**

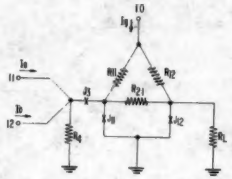
**Junichi Sone, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 416,424, Sep. 9, 1982, abandoned. This application Jul. 11, 1985, Ser. No. 754,209**

**Claims priority, application Japan, Sep. 14, 1981, 56-145314**

**Int. Cl.[4] H03K *19/195***

**U.S. Cl. 307—462** **13 Claims**



1. A circuit utilizing Josephson junctions of the type having first and second ends and having a low impedance between said first and second ends in a zero voltage state and a high impedance between said first and second ends in a voltage state and changing from said zero voltage state to said voltage state in response to a current flowing between said first and second ends which is greater than a respective critical current, said circuit comprising a first group of "N" ($N \geq 2$) resistors connected together at one end thereof and each having a predetermined resistance, a second group of "N−1" resistors each being connected between the other ends of two of said "N" resistors and having a predetermined resistance, said second group of resistors being connected in series between a first node and a second node, one end of the series connection of said second group of resistors being directly connected to said first node and the other end of said series connection of said second group of resistors being directly connected to said second node, a first group of "N" Josephson junctions each connected between a reference potential and a respective one of said other ends of said first group resistors and each having a predetermined critical current, each of said Josephson junctions in said first group of "N" Josephson junctions being connected to one of the other ends of the first group of resistors independently of said second group of resistors, a first additional Josephson junction having first and second ends and connected at said first end thereof with said first node and having a predetermined critical current, and a first additional resistor connected between said reference potential and said second end of said first additional Josephson junction and having a predetermined resistance.

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**4,611,133**

**HIGH SPEED FULLY PRECHARGED PROGRAMMABLE LOGIC ARRAY**

**Benjamin C. Peterson, Tempe, Ariz.; Yoseph L. Linde, Needham, Mass., and Yigal Brandman, Stanford, Calif., assignors to Codex Corporation, Mansfield, Mass.**

**Filed May 12, 1983, Ser. No. 493,901**

**Int. Cl.[4] H03K *19/177, 19/017, 19/096, 19/20***

**U.S. Cl. 307—465** **4 Claims**

2. A logic array having a first portion and a second portion, comprising:

the first portion having a first plurality of virtual ground lines;

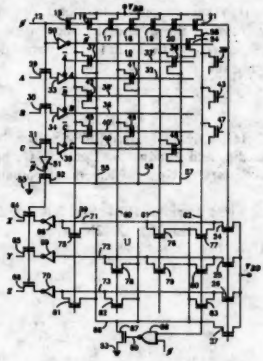
the second portion having a second plurality of virtual ground lines;

first means for precharging the first plurality of virtual ground lines;

second means for precharging the second plurality of virtual ground lines wherein a single precharge signal enables both the first and second means;

third means for coupling the first plurality of virtual ground lines to ground;

fourth means for coupling the second plurality of virtual ground lines to ground wherein a single control signal enables both the third and fourth means; and



delay means coupled to the fourth means and responsive to the control signal for delaying the coupling of the second plurality of virtual ground lines to ground.

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**4,611,134**

## BOOTSTRAP DRIVING CIRCUIT

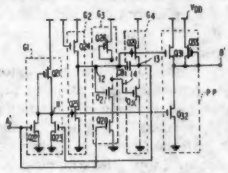
**Manabu Ando, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 28, 1983, Ser. No. 518,259**

**Claims priority, application Japan, Jul. 28, 1982, 57-131489**

**Int. Cl.⁴ H03K** *3/353, 19/094*

**U.S. Cl. 307—482** **12 Claims**



1. A driving circuit comprising a first field effect transistor coupled between a first terminal and a first potential terminal, a second field effect transistor coupled between said first terminal and a second potential terminal, a capacitor coupled between a gate of said first transistor and said first terminal, a first means for receiving an input signal having first and second logic levels, a second means coupled to both of said first means and said first terminal for rendering said first field effect transistor conductive when said input signal is at said first logic level and/or the signal at said first terminal is near said first potential, and a third means coupled to the gate of said first field effect transistor, said first means and a gate of said second field effect transistor for controlling said second transistor, said third means making said second transistor non-conducting only when the potential at the gate of said first transistor is near said first potential and said input signal takes said first logic level.

**4,611,135**

## ANALOG SWITCH CIRCUIT AND SIGNAL ATTENUATOR EMPLOYING AN ANALOG SWITCH CIRCUIT

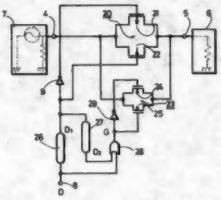
**Yoshio Nakayama, Menuma; Fuminori Abe, and Naofumi Nagasawa, both of Ooizumi, all of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan**

**Filed Sep. 9, 1983, Ser. No. 531,178**

**Claims priority, application Japan, Sep. 13, 1982, 57-160026; Sep. 13, 1982, 57-160028**

**Int. Cl.⁴ H03K** *17/16, 17/687*

**U.S. Cl. 307—572** **8 Claims**



1. An analog switch circuit, comprising:

an output terminal connected to a load having a given impedance,

an input terminal connected to an input signal source having an impedance lower than the impedance of said load,

a control signal input terminal receiving a control signal,

first transfer gate means including a first P-type and a first N-type field-effect transistor, each having first, second, and third electrodes, each of said first electrodes being commonly connected to said output terminal, and each of said second electrodes being commonly connected to said input terminal,

second transfer gate means including a second P-type and a second N-type field-effect transistor, each including first, second, and third electrodes, each of said second transfer gate means first electrodes being commonly connected and being connected in parallel with said commonly connected first electrodes of said first transfer gate means, each of said second electrodes of said second transfer gate means being commonly connected and being connected in parallel with said commonly connected second electrodes of said first transfer gate means, said second P-type and N-type field effect transistors each having a gate size smaller than that of said first P-type and N-type field effect transistors included in said first transfer gate means, and

control means responsive to a control signal supplied to said control signal input terminal for applying a signal to each one of said third electrodes of said second transfer gate means so that said second transfer gate means is first turned on and for applying thereafter a signal to each one of said third electrodes of said first tranfer gate means so that said first gate means is then turned on.

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**4,611,136**

## SIGNAL DELAY GENERATING CIRCUIT

**Norikazu Fujie, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Dec. 14, 1983, Ser. No. 561,439**

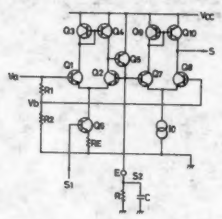
**Claims priority, application Japan, Dec. 14, 1982, 57-217769**

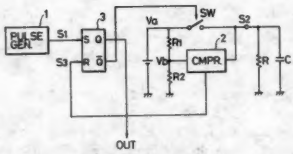
**Int. Cl.⁴ H03K** *5/13, 5/04, 5/05*

**U.S. Cl. 307—603** **5 Claims**

5. A signal generating circuit, comprising: a switch, the operative position of which is controlled by a timing signal source; first through third resistors coupled in series with one another between first and second terminals of a voltage source

said first terminal of said voltage source being coupled to a first terminal of said switch; a parallel RC circuit having a first terminal coupled to a second terminal of said switch and a second terminal coupled to said second terminal of said voltage source; a first comparator having a first input coupled to a junction point between said first and second resistors and a second input coupled to said second terminal of said switch; a second comparator having a first input coupled to a junction






between said second and third resistors and a second terminal coupled to said second terminal of said switch; and an OR gate having an inverting first input coupled to an output of said timing signal source, an inverting second input coupled to an output of said first comparator, and a noninverting third input coupled to an output of said second comparator, an output of said signal generating circuit being provided at an output of said OR gate.

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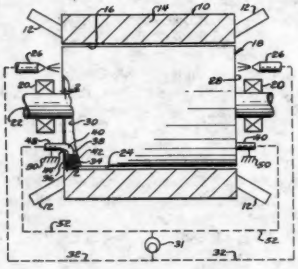
**4,611,137**

## COOLING OF DYNAMOELECTRIC MACHINES

**Thomas Sutrina, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Oct. 25, 1985, Ser. No. 791,416**
**Int. Cl.[4] H02K *9/00***
**U.S. Cl. 310—54** **8 Claims**



1. A dynamoelectric machine comprising;

a stator;

a rotor journalled for rotation within said stator and separated therefrom by an air gap;

means for supplying a liquid coolant to said rotor and including a pressure pump; and

means for removing coolant from said rotor including means on said rotor defining an annular, generally radially inwardly opening groove for receiving, under centrifugal force, coolant on said rotor, and a fixed conduit having an end within said groove, said end opening within said groove toward the intended direction of rotation of said rotor, said conduit being in fluid communication with said supplying means.

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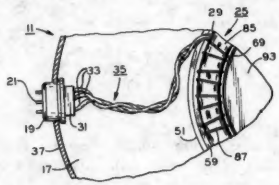
**4,611,138**

## HERMETIC COMPRESSOR UNIT

**Alan L. Kindig, and Fredus N. Peters, III, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.**

**Filed Apr. 30, 1984, Ser. No. 605,266**
**Int. Cl.[4] A02K *11/00***
**U.S. Cl. 310—71** **6 Claims**



1. A hermetic compressor unit driven by a dynamoelectric machine therein adapted to be energized from a source of power, the hermetic compressor unit comprising:

a housing having a hermetically sealed chamber therein;

means mounted to said housing so as to extend in part therethrough and adapted for connection with the power source, said connection means including a set of electrical connectors;

a stationary assembly of said dynamoelectric machine in said chamber and including a stator having a pair of opposite end faces, a bore extending generally axially through said stator and intersecting with said opposite end faces thereof, and a plurality of winding means receiving slots intersecting with both said bore and said opposite end faces, respectively;

winding means associated with said stator and adapted for excitation upon the energization of said dynamoelectric machine, said winding means including a plurality of coils respectively formed of a conductor having a coating of dielectric material thereon and each coil having at least one conductor loop with opposite side loop portions thereof received in said slots of said stator and with opposite end loop portions arranged in opposite generally annular groupings thereof adjacent said opposite end faces of said stator, respectively, some of said coils defining a main winding of said winding means and others of said coils defining an auxiliary winding of said winding means, respectively, a pair of main winding lead ends of said conductor integral with said main winding and extending from said opposite end loop groupings of said winding means, a pair of auxiliary winding lead ends of said conductor integral with said auxiliary winding and extending from said one end loop grouping of said winding means at least generally adjacent said main winding lead ends, respectively, one of said main winding lead ends and one of said auxiliary winding lead ends being twisted together to define a common lead end of said winding means, and a set of terminals on said common lead end, the other of said main winding lead ends and the other of said auxiliary winding lead ends, respectively;

plug means for connecting said winding means in circuit

relation with said connection means, said plug means including casing means for receiving said terminals and removably mounted to said electrical connectors for connecting said terminals in the circuit relation therewith, respectively;

a set of elongate tubes of a dielectric material encasing said common lead end, said other main winding lead end and said other auxiliary winding lead end and extending generally between said casing means and said one end loop grouping of said winding means, said elongate tubes with said common lead end, said other main winding lead end and said other auxiliary winding lead end encased therein being twisted together generally into a twisted bundle thereof and said common lead end, said other main winding lead end and said other auxiliary winding lead end taking a memory set so as to at least in part maintain said elongate tubes against displacement from the twisted bundle thereof, respectively;

a compressor within said chamber including means for supporting said dynamoelectric machine;

a set of means for resiliently mounting both said compressor and said dynamoelectric machine to said housing within said chamber;

a rotor of said dynamoelectric machine disposed at least in part within said bore of said stator and associated in magnetic coupling relation with said winding means upon the excitation thereof; and

a shaft supporting said rotor and drivingly interconnected with said compressor.

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**4,611,139**

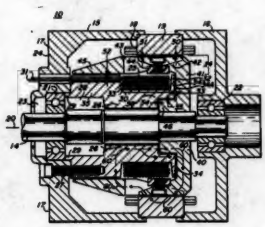
## AXIAL AIR GAP BRUSHLESS ALTERNATOR

**Mikhail Godkin, Chicago, and Kevin S. Moran, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 426,571, Sep. 29, 1982, abandoned. This application Jul. 8, 1985, Ser. No. 753,368**

**Int. Cl.[4] H02K *1/22***

**U.S. Cl. 310—266** **24 Claims**



1. An alternating current generator comprising:

an alternator outer housing;

a rotatable shaft having a longitudinal axis, said shaft extending longitudinally within said housing and rotatable with respect to said housing aout said axis;

a stator assembly having a magnetic stator core with a stator coil wound thereon defining an effective axial stator coil length along said shaft axis, said stator core being located within and fixed with respect to said housing;

a field assembly having a magnetic fluid core with a field coil wound thereon defining an effective axial field coil length along said shaft axis, said field core being located within and fixed with respect to said housing;

said stator coil and core radially spaced apart from said field coil and core with respect to said shaft axis thereby defining a cylindrical radial air gap therebetween;

at least one of said stator and field magnetic cores having a core end portion axially extending beyond the effective length of the coil wound thereon;

a rotor assembly fixed to and rotatable with said shaft and including at least a first magnetic claw pole member fixed to said shaft and having magnetic fingers extending into said cylindrical radial gap and forming a low reluctance radial flux air gap between said claw pole member fingers and at least one of said stator and field magnetic cores;

wherein the improvement comprises,

said first magnetic claw pole member having magnetic portions that radially extend with respect to said shaft axis and form a low reluctance axial flux air gap with a radially extending end surface of said axially extending core end portion at a position axially beyond the effective axial length of the coil wound on the core having said axially extending core end portion, wherein said axial flux air gap provides a low reluctance magnetic path for conducting a substnatial portion of flux created by said field coil in said field core, wherein said field coil and field magnetic core are radially spaced apart from said shaft with said stator coil and stator magnetic core being further radially spaced apart from said shaft, and wherein said field coil has two opposite effective ends with said effective axial length of said coil defined therebetween, and wherein said field core is generally cylindrical in shape and is positioned about said rotatable shaft with said shaft being substantially non-flux conductive with respect to field coil flux and being positioned directly adjacent to said field core along a majority of the effective axial length of said field coil, said one core having an end, which includes said core end portion, that extends radially with respect to said shaft axis and forms one entire radially extending end surface of said one core which is positioned directly adjacent to radial extension portions of said first claw pole member which extend from said shaft to form a low reluctance axial flux air gap along substantially all of said entire radially extending end surface.

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**4,611,140**

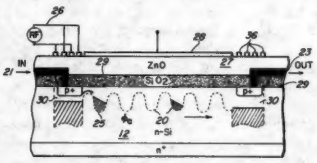
## SAW-CTD PARALLEL TO SERIAL IMAGER

**Robert R. Whitlock, College Park, and Nicolas A. Papanicolaou, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 26, 1985, Ser. No. 769,099**

**Int. Cl.[4] H01L *41/08***

**U.S. Cl. 310—313 B** **11 Claims**




1. A line imager comprising:

a semiconductor body;

a planar, transparent piezoelectric body having a main surface overlying and in proximity to the semiconductor body;

wave propagation means for propagating acoustic waves on the main surface of the piezoelectric body to create traveling potential wells in the underlying semiconductor body;

a traveling potential well path located in the semiconductor, the traveling potential well path beginning at the wave propogation means and extending straight away therefrom;

semiconductor depletion means for depleting the semiconductor of majority charge carriers along the traveling potential well path, the depletion means located atop the piezoelectric body;

a gate located on the semiconductor body and alongside and

parallel to the traveling potential well path and adjoining the semiconductor depletion means;

a plurality of sensor pixels for accumulating charge, the sensor pixels located in the semiconductor body, the pixels aligned next to each other and running parallel to, alongside and overlapping the gate so the integrated charge in each sensor pixel will proceed into their respective traveling potential wells when the potential across the gate is lowered, the gate having length at least equal to the length of the plurality of sensor pixels; and

a dump gate located on the semiconductor and parallel to and overlapping the plurality of sensor pixels, the plurality of sensor pixels being situated between the dump gate and the gate, the dump gate causing the charge integrated in the plurality of sensor pixels to flow to ground when the potential across the dump gate is lowered, the dump gate being at least as long as the length of the plurality of sensor pixels.

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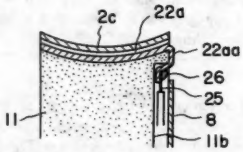
## 4,611,141
## LEAD STRUCTURE FOR A PIEZOELECTRIC ARRAY-TYPE ULTRASONIC PROBE

**Akira Hamada; Akira Funakoshi, and Keiichi Ohira, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 20, 1985, Ser. No. 703,383**
**Claims priority, application Japan, Mar. 5, 1984, 59-30616[U]**
**Int. Cl.⁴ H01L *41/08***
**U.S. Cl. 310—334** **13 Claims**




1. An array-type ultrasonic probe for an ultrasonic transducer comprising:

a substrate having a top face and a side wall,

a plurality of stripe-form back electrodes arranged in parallel with and spaced apart from each other by a gap which is smaller than the width of said stripe-form back electrodes, said electrodes being arranged on the top face of the substrate,

a polymer piezoelectric film applied on the plurality of back electrodes, and

a front electrode on the polymer piezoelectric film,

each of said plurality of stripe-form back electrodes having an end portion protruding from the top face of the substrate; said end portion being reduced in thickness as compared with the remaining portion of each back electrode on the substrate without an increase in width of the end portion, bent along the side wall of the substrate and electrically connected to a lead wire from the ultrasonic transducer.

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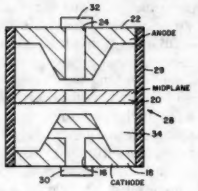
## 4,611,142
## SELF-PUMPED SPARK GAP

**James H. Bentley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 21, 1984, Ser. No. 684,835**
**Int. Cl.⁴ H01J *17/16, 17/28***
**U.S. Cl. 313—30** **1 Claim**

1. A device for switching high voltage current in large amounts comprising: an insulating housing containing a chamber open at first and second ends, first and second one way valves mounted on said housing for opening and closing respective ends of said chamber, first and second electrodes disposed in said chamber in spaced relationship to form a spark gap therebetween, a third electrode between said first and second electrodes, a heat exchanger open at first and second ends, a first conduit in fluid connection with said first one way




valve on one end and the first end of said heat exchanger on the other end, and a second conduit in fluid connection with the second end of said heat exchanger on one end and said second one way valve on the other end.

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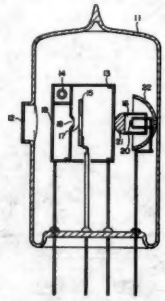
## 4,611,143
## COMPOSITE LIGHT SOURCE

**Yuji Shimazu, and Makoto Miyamoto, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan**

**Filed May 3, 1984, Ser. No. 607,396**
**Claims priority, application Japan, May 24, 1983, 58-90900**
**Int. Cl.⁴ H01J *5/16, 61/40;* H01K *1/26***
**U.S. Cl. 313—111** **6 Claims**




1. A composite light source comprising

a sealed envelope having a transparent window therein, said envelope including a longitudinal axis and being filled with deuterium gas;

an electrode structure housed within said envelope for forming an arc discharge in said deuterium gas, said electrode structure comprising

a cathode;

an anode having an aperture therein; and

a separation wall interposed between said cathode and said anode, said separation wall having a focusing aperture therein for focusing said arc discharge;

a tungsten lamp housed within said envelope, said tungsten lamp having a filament for emitting a light beam; and

optical means housed within said envelope for focusing the light beam from said filament at the location of said focused arc discharge, the transparent window located in said sealed envelope;

the focusing aperture in said separation wall, the aperture in said anode and the filament of said tungsten lamp being arranged sequentially with their centers along a straight line, whereby light emitted from at least one of said arc discharge in said deteurium gas and from said tungsten

lamp are transmitted through the transparent window in said sealed envelope.

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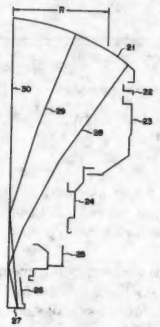
**4,611,144**
**X-RAY IMAGE TUBE**

**Hiroshi Minami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Apr. 3, 1985, Ser. No. 719,540**
**Claims priority, application Japan, Apr. 6, 1984, 59-68465**
**Int. Cl.⁴ H01J** *35/14*
**U.S. Cl. 313—373** **5 Claims**




1. An X-ray image tube comprising: a vacuum envelope; a photocathode arranged at an input side in said vacuum envelope and having a curved surface open to an output side thereof; and a phosphor screen arranged at an output side in said vacuum envelope and having a surface on which electrons emitted from said photocathode are electrooptically focused, wherein said photocathode comprises a central surface region with a diameter which is ½ to 4/5 of the diameter of the photocathode and a peripheral surface region, said central surface region has a profile such that an increment of the meridional curvature radius from said center to a peripheral portion thereof is larger than a constant derived from a linearity between the increment and a distance from the axis of said photocathode, and said peripheral surface region has a profile such that an increment of the meridional curvature radius from an inner peripheral portion to an outer peripheral portion is smaller than the constant derived from a linearity between the increment and the distance from the axis of said photocathode.

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**4,611,145**
**CATHODE RAY TUBE CATHODE WITH CAP AND SLEEVE STRUCTURE**

**Jerry A. Kamuf, Owensboro, and Russell L. Arnold, Reynolds Station, both of Ky., assignors to Premium Allied Tool, Inc., Owensboro, Ky.**

**Filed Sep. 25, 1984, Ser. No. 653,910**
**Int. Cl.⁴ H01J** *29/04, 9/04*
**U.S. Cl. 313—446** **3 Claims**

1. A cathode structure for use in cathode ray tubes comprising

a hollow metallic sleeve having a cylindrically shaped end portion wherein an edge portion of said cylindrical end portion is folded outwardly and backwardly around and against an outer surface of said sleeve, and

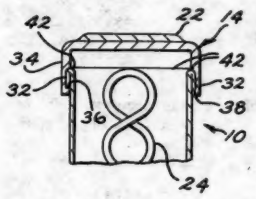
a circular metallic cap disposed over said folded edge portion and having a circular sidewall defining an annularly shaped ledge extending in and around an interior surface thereof, a backwardly extending edge of said folded edge portion being seated on said ledge, thereby to increase the resistance of said cap to being pushed off of said sleeve.

3. A method of forming a cathode structure for use in cathode ray tubes comprising

providing a hollow metallic sleeve having a cylindrically shaped end portion,

folding an edge portion of said cylindrical end portion outwardly and downwardly around an outer surface of said sleeve to form a rounded end on said sleeve,

providing a metallic cap having a circular surface surrounded by a circular sidewall,




disposing said cap over the rounded end and folded edge portion of said sleeve, and

mashing the sidewall of said cap inwardly against said folded end portion to deform an interior surface of said sidewall and thus form an annular ledge in said sidewall upon which the end of said folded end portion will seat so as to increase the resistance of said cap to being pushed off the end of said sleeve.

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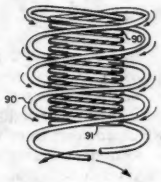
**4,611,146**
**INDIRECTLY HEATED CATHODE**

**Raymond C. Morrison, Scituate, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed Dec. 31, 1981, Ser. No. 336,233**
**Int. Cl.⁴ H01J** *29/48, 1/20, 1/16*
**U.S. Cl. 313—446** **16 Claims**




1. An electrode comprising a uniform diameter wire having first and second coils formed in respective integral portions of the wire, the first coil being moveably disposed within the second coil and terminating at one end in an adjacent end portion of the second coil.

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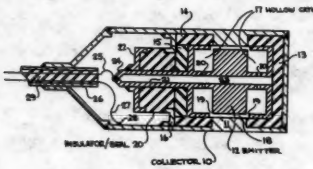
**4,611,147**
**THERMIONIC GAS SWITCH**

**George L. Hatch, San Francisco; William A. Brummond, Livermore, and Donald M. Barrus, San Jose, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 5, 1984, Ser. No. 596,870**
**Int. Cl.⁴ H01J** *17/52, 17/06*
**U.S. Cl. 313—550** **20 Claims**

1. In a thermionic switch responsive to temperature and including an emitter electrode, a collector electrode positioned around the emitter electrode, means for electrically insulating the emitter electrode from the collector electrode, and a quantity of thermionic material located within the collector electrode, the improvement comprising: said emitter electrode

being constructed so as to have a plurality of surfaces, said surfaces being positioned with respect to said collector electrode such that during an "off" mode thereof only a portion of



the surface of the emitter electrode is effective, and during an "on" mode all of the surfaces of the emitter electrode are effective.

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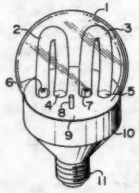
**4,611,148**

## LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

**Yasuo Kato, Zama; Tetsuo Ono, Kokubunji; Yoshio Watanabe, Tokyo; Seiichi Murayama, Kokubunji; Shigeo Mikoshiba, Tokyo, and Hiromitsu Matsuno, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 6, 1984, Ser. No. 577,611**
**Claims priority, application Japan, Feb. 21, 1983, 58-26168**
**Int. Cl.[4] H01J** *17/44, 61/54*
**U.S. Cl. 313—595** **9 Claims**



1. A low-pressure mercury vapor discharge lamp comprising an outer bulb provided with a rare gas and mercury therein, a plurality of inner tubes bent and housed in said outer bulb, each of said inner tubes being provided with an opening at one end thereof which communicates with the interior of said outer bulb and an electrode sealed in the other end thereof, a starting probe disposed between said open ends of said inner tubes and being located inside of said outer bulb, an operating circuit connected to said electrodes, and a starting probe circuit connected to said starting probe for applying a high voltage to said starting probe at the time of starting of the lamp.

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**4,611,149**

## BEAM TUBE WITH DENSITY PLUS VELOCITY MODULATION

**Richard B. Nelson, Los Altos Hills, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Filed Nov. 7, 1984, Ser. No. 669,206**
**Int. Cl.[4] H01J** *25/00*
**U.S. Cl. 315—5.39** **15 Claims**

1. A high-frequency amplifier tube comprising:

a vacuum envelope;

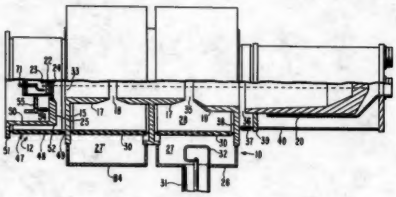
a gun for generating a linear beam of electrons, said gun comprising a thermionic cathode, means for heating said cathode, and an electron-permeable grid insulated from said cathode and spaced close to the emissive surface of said cathode;

means for applying a radio-frequency input signal voltage between said cathode and said grid and biasing said grid so that beam current is drawn over approximately ½ of the radio-frequency cycle;

anode means for drawing a beam of electrons from said gun, said anode means comprising an aperture for passage of said beam through an extended hollow metallic drift tube;

collector means beyond the end of said drift tube opposite said anode for collecting said electrons and dissipating their remaining energy;

output circuit means for extracting rf energy from said beam



comprising, a transverse output gap in said drift tube, means for coupling a resonant output circuit across said gap, and means for extracting energy from said resonant circuit;

the improvement wherein being means for increasing the efficiency of said tube, comprising a second gap in said drift tube on the anode side of said output gap, and means for coupling across said second gap an intermediate circuit resonant at a frequency above the operating frequency band of said tube.

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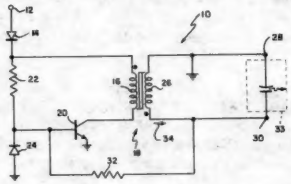
**4,611,150**

## LOAD RESPONSIVE INVERTER FOR ELECTROLUMINESCENT LAMP

**Ervin M. Ball, Zionsville, and Jack E. Hutson, Indianapolis, both of Ind., assignors to Microlite, Inc., Westfield, Ind.**

**Filed Aug. 16, 1984, Ser. No. 641,309**
**Int. Cl.[4] H05B** *37/02*
**U.S. Cl. 315—307** **8 Claims**



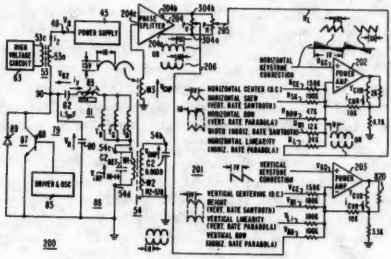
1. An inverter for providing power to an electroluminescent lamp, comprising

oscillating means having an input and output, means for coupling the input to a source providing a substantially D.C. signal, means for coupling the output to the electroluminescent lamp, feedback means for sensing the voltage across the electroluminescent lamp, means for coupling the feedback means to the electroluminescent lamp, means for coupling the feedback means to the oscillating means, the oscillating means responsive to the feedback means for generating a time varying signal at its output at a frequency related to the voltage sensed by the feedback means.

## 4,611,151
## DEFLECTION RATE PARABOLIC WAVEFORM GENERATING CIRCUIT

**Alan A. Hoover, New Palestine; David W. Luz, and Jeffery B. Lendaro, both of Indianapolis, all of Ind., assignors to RCA Corporation, Princeton, N.J.**

**Filed Mar. 21, 1985, Ser. No. 714,579**
**Int. Cl.[4] H01J** *29/70, 29/76*
**U.S. Cl. 315—368** **8 Claims**



1. An apparatus for generating a deflection rate parabolic convergence current component in an auxiliary deflection winding of a cathode ray tube and a dynamic focus voltage that is coupled to said cathode ray tube, comprising:

a main deflection winding;

a deflection generator coupled to said main deflection winding for generating a trace scanning current therein during a trace interval;

a transformer having first, second and third windings, said third winding being coupled in a current path of said deflection winding such that said trace scanning current through said main deflection winding flows between first and second terminals of said third winding;

a parabolic voltage developing capacitance coupled to said second winding, said parabolic voltage developing capacitance being reflected as a capacitive impedance between said first and second terminals of said third winding, wherein said trace scanning current in said third winding of said transformer causes a deflection rate, parabolic voltage to be developed across said reflected capacitive impedance for developing a deflection rate, parabolic, first voltage in said first winding of said transformer;

convergence means coupled to said auxiliary deflection winding and to said first winding and responsive to said first voltage for generating a deflection rate parabolic current component in said auxiliary deflection winding; and

a source of an AC, second voltage coupled to said second winding in such a way that said transformer prevents said second voltage from substantially affecting said first voltage in said first winding, said second voltage producing at a terminal of said second winding said dynamic focus voltage that is determined in accordance with the voltage across said second winding that is parabolic and in accordance with said second voltage.

## 4,611,152
## HIGH DC VOLTAGE GENERATOR

**Hideo Hishiki, and Yukio Kamiyama, both of Iwai, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan**

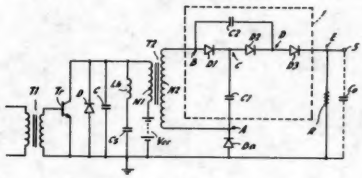
**Filed Mar. 21, 1984, Ser. No. 591,748**
**Claims priority, application Japan, Mar. 22, 1983, 58-47575**
**Int. Cl.[4] H01J** *29/70;* **H04N** *5/63*
**U.S. Cl. 315—411** **20 Claims**

1. A high DC voltage generator comprising:

a stepup transformer including a primary winding and a secondary winding having a first terminal connected through a first circuit to a high voltage terminal of the high voltage generator and a second terminal connected through a second circuit to ground;

means connected to said primary winding for generating therein a time-varying current and inducing a high voltage pulse in said secondary winding in response to a rapid change that occurs regularly in the time-varying current;

a plurality of first diodes and a plurality of capacitors, said diodes and capacitors being arranged to form at least a substantial part of a voltage multiplier in said first and second circuits for multiplying the amplitude of said pulse and delivering a high DC voltage through said first circuit to said output terminal; and



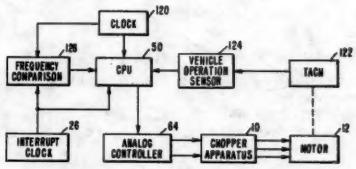
a second diode connected in said second circuit so that a current may flow in a loop through said first diodes and second diode in response to said pulse to generate potentials of opposite polarities across said first and second terminals with respect to a neutral point in said secondary winding, said second diode being arranged to be reverse-biased to form a capacitance in series with a distributed capacitance of said secondary winding,

wherein said first and second diodes and said capacitors are connected in a symmetrical configuration with respect to said neutral point so that said neutral point is maintained at a potential which is substantially one-half the voltage delivered to said output terminal.

## 4,611,153
## CHOPPER FREQUENCY DETERMINATION APPARATUS

**Henry J. Wesling, Mt. Oliver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 31, 1983, Ser. No. 528,288**
**Int. Cl.[4] H02P** *5/06*
**U.S. Cl. 318—318** **8 Claims**




1. In combination a control apparatus for a motor, a chopper responsive to first signals from a chopper interrupt clock having a first frequency, said motor being operative with a programmed microprocessor, said microprocessor being operative with second signals from the microprocessors internal clock having a second frequency,

means for sensing a predetermined operation of said motor and supplying a control signal when said operation of said motor is sensed,

means responsive to said control signal for determining the frequency of the chopper interrupt clock by comparing said chopper interrupt first frequency signals with said microprocessor internal clock second frequency signals to

determine the number of second frequency signals that are provided between successive first frequency signals to establish when there has been a predetermined frequency change in said first frequency signals, and

means coupled with the motor and responsive to said predetermined frequency change in said first frequency signals for terminating the operation of said motor.

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## 4,611,154

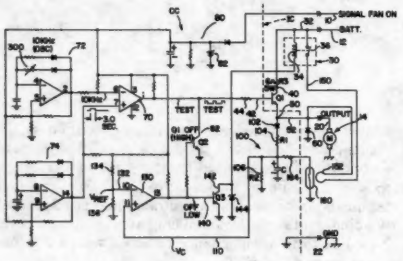
## METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF A DC LOAD

**George P. Lambropoulos, Groose Pt. Woods; Benjamin J. Charboneau, Wixom, and David H. Ellola, Southfield, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.**

**Filed Mar. 28, 1985, Ser. No. 718,722**

**Int. Cl.⁴ H02P *1/04***

**U.S. Cl. 318—490** **59 Claims**



44. A method of sensing a stalled or short condition in a motor circuit including the winding of an electric motor to be driven by a relatively high current from a D.C. power supply, said method comprising the steps of:

(a) passing a low magnitude testing current through said motor circuit;

(b) measuring the average voltage across the motor of said motor circuit during a testing cycle of a given time length while only said testing current is flowing through said motor circuit;

(c) comparing said average voltage with a reference signal; and,

(d) passing said high current through said motor circuit when said comparison is at a given relationship of the average voltage and the reference signal.

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## 4,611,155

## SERVO CONTROL CIRCUIT

**Mitsuo Kurakake, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan**

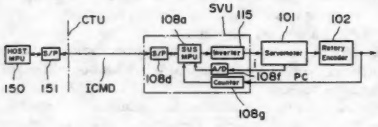
**PCT No. PCT/JP84/00177, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/04006, PCT Pub. Date Oct. 11, 1984**

**PCT Filed Apr. 7, 1984, Ser. No. 683,277**

**Claims priority, application Japan, Apr. 7, 1983, 58-061316**

**Int. Cl.⁴ G05B *19/28***

**U.S. Cl. 318—603** **3 Claims**




1. A servo control circuit for a servomotor, comprising:

a servoamplifier comprising:

a voltage supply circuit for supplying said servomotor with a drive voltage;

a sensing circuit for sensing a drive current of said servomotor;

a rotation sensor, coupled to said servomotor, for producing output pulses corresponding to the rpm of said servomotor;

a single counter, connected to said rotation sensor, for counting the output pulses of said rotation sensor; and

a servoamplifier processor, connected to said voltage supply circuit, said sensing circuit and said counter, for controlling an output voltage of said voltage supply circuit by executing current loop control during period $T_1$ in response to an applied torque command input and producing position information from the count; and

a main processor, connected to said servoamplifier, for producing as an output said torque command by executing position and velocity loop control during a period $T_2$ ($T_2 > T_1$) in dependence upon the position information from said servomotor, said servoamplifier processor reading and accumulating a value from said counter during the period $T_1$ and delivering the accumulated value to said main processor as said position information at the end of period $T_2$.

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## 4,611,156

## METHOD AND APPARATUS FOR DETERMINING THE POSITION OR DIMENSIONS OF A TEST OBJECT

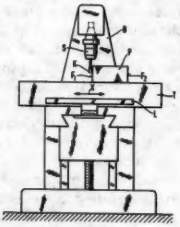
**Kurt Feichtinger, Palling, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany**

**Filed Oct. 5, 1984, Ser. No. 658,195**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336854**

**Int. Cl.⁴ G05B *19/18***

**U.S. Cl. 318—632** **12 Claims**



1. In a process for measuring the position and/or dimensions of a test object with at least a measuring system coupled to a switching sensor, wherein the switching sensor is movable relative to the test object with an approach velocity, wherein the measuring system generates a measuring signal indicative of the relative position of the switching sensor with respect to the test object, and wherein the switching sensor generates a sensing signal upon contact with the test object, the improvement comprising:

storing a set of correction values indicative of previously determined switching sensor errors, said errors resulting from the velocity of approach between the test object and the switching sensor, and the material characteristics of the switching sensor and the test object;

utilizing the sensing signal to store a value of the measuring signal; and

correcting the value of the measuring signal with at least a selected one of the correction values to substantially eliminate errors said at least a selected one of the correction values selected in accordance with said at least one of (1) the velocity of approach between the test object and the

switching sensor and (2) material characteristics of the switching sensor and the test object.

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4,611,157

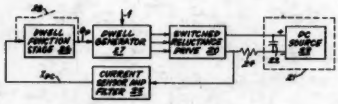
## SWITCHED RELUCTANCE MOTOR DRIVE OPERATING WITHOUT A SHAFT POSITION SENSOR

Timothy J. E. Miller, Schenectady, N.Y., and James T. Bass, College Station, Tex., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 8, 1985, Ser. No. 699,537

Int. Cl.[4] H02P 8/00

U.S. Cl. 318—696 13 Claims




1. An open loop method of controlling at least one phase in a converter-driven multiphase variable reluctance drive, said method comprising the steps of:

measuring load torque; and

setting the dwell angle of the phase current supplied by said converter to said one phase according to a relationship which increases said dwell angle in response to an increase in said measured load torque and which decreases said dwell angle in response to a decrease in said measured load torque, whereby said drive is operated near its pull-out torque for all normal values of instantaneous load torque.

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4,611,158

## METHOD AND APPARATUS FOR CONTROLLING PWM INVERTER

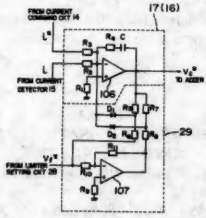
Hiroshi Nagase; Yasuo Matsuda, both of Hitachi, and Hisakazu Ninomiya, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,696

Claims priority, application Japan, Feb. 28, 1983, 58-33230; Dec. 5, 1983, 58-228431

Int. Cl.[4] H02P 5/40

U.S. Cl. 318—803 19 Claims




1. A method for controlling a PWM inverter for driving an AC motor comprising the steps of preparing a speed command signal representing a desired speed of AC motor; comparing said speed command signal with a signal indicative of the detected speed of said motor for producing a current command signal; producing a voltage command signal whose amplitude is a function of the difference between the current command signal and a current signal representing a detected current in each phase of said AC motor while suppressing ripples included in said voltage command signal in each phase to a level which decreases with a decrease of the rotation speed of said AC motor; and producing a PWM pulse signal controlling the PWM inverter by comparing said voltage command signal with a carrier wave signal.

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4,611,159

## AC MOTOR CONTROL SYSTEM

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

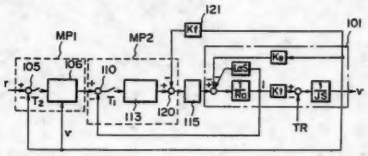
PCT No. PCT/JP83/00421, § 371 Date Jul. 23, 1984, § 102(e) Date Jul. 23, 1984, PCT Pub. No. WO84/02235, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 25, 1983, Ser. No. 637,219

Claims priority, application Japan, Nov. 25, 1982, 57-206424

Int. Cl.[4] H02P 5/40

U.S. Cl. 318—803 3 Claims




1. An AC motor control system comprising:

(a) velocity sensor means for sensing the velocity of an AC motor;

(b) current sensor means for sensing an actual current flowing into said AC motor;

(c) power drive circuit means for receiving a drive command and for driving said AC motor in accordance with said drive command; and

(d) control means for performing a velocity loop computation at a first sampling period to obtain a current command from an offset velocity between a velocity command for said AC motor and said sensed actual velocity, and for performing a current loop computation to obtain an offset current between said current command and said sensed actual current, in said current loop computation, there is obtained a velocity compensation signal by amplifying said sensed actual velocity by a predetermined magnification, and the drive command for said power drive circuit is compensated by said velocity compensation signal, said current loop computation is executed at a second sampling period being shorter than said first sampling period, and, at the time of the velocity loop computation, the actual current at the relevant sampling instant is estimated from the current command value of the previous second sampling period, and the current command is computed from the estimated actual current and said offset current.

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4,611,160

## CHARGING DEVICE

Murray I. C. Camens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,575

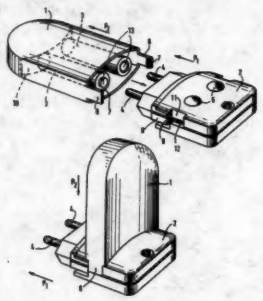
Claims priority, application Netherlands, Jan. 9, 1984, 8400065

Int. Cl.[4] H02J 7/00; H01M 2/10, 10/46

U.S. Cl. 320—2 7 Claims

1. A device for charging a rechargeable electric power source, which comprises a first section and a second section capable of being assembled in two positions relative to each other, one of said positions being a rest position and the other of said positions being a charging position, the first section being formed to receive a rechargeable electric power source; electric components arranged in said second section as a charging circuit for charging a rechargeable electric power source; connector pins provided on said second section for cooperating with an electric mains socket, said connector pins being

connected to the electric components of the charging circuit; in the rest position the connector pins being covered by the first section; in the charging position the connector pins being clear of the first section and the rechargeable electric power



source in the first section being electrically connected to the electric components of the charging circuit in the second section; and a flexible electrical contact member arranged in the first section for exerting pressure against the rechargeable electric power source.

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**4,611,161**

## RECHARGEABLE BATTERY SYSTEM

**Peter F. Barker, 13 Maze Hill, St. Leonards on Sea, East Sussex TN38 OBA, United Kingdom**

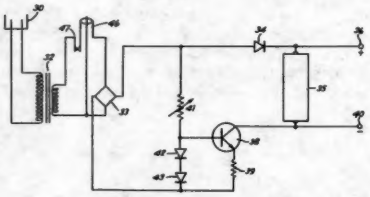
**PCT No. PCT/GB82/00162, § 371 Date Jan. 28, 1983, § 102(e) Date Jan. 28, 1983, PCT Pub. No. WO82/04355, PCT Pub. Date Dec. 9, 1982**

**PCT Filed Jun. 1, 1982, Ser. No. 464,497**

**Claims priority, application United Kingdom, May 29, 1981, 8116547**

**Int. Cl.⁴ H02J *7/00***

**U.S. Cl. 320—2** **12 Claims**



1. A rechargeable electric battery comprising a casing with external terminals of standard dry-battery dimensions, one or more nickel-cadmium cells positioned within said casing and a constant-current charging unit positioned within said casing and connected to the cell or cells, said constant-current charging unit comprising a first terminal means for a.c. external supply, a step-down transformer having primary and secondary windings, said primary winding connected to said first terminal means, a second terminal means for d.c. external supply, a first bridge rectifier, said secondary winding and second terminal means being connected to said rectifier, disconnecting means interconnecting said second terminal means and said secondary winding for disconnecting the said first terminal means when said second terminal means is used and a feedback circuit to maintain constant current charging.

**4,611,162**

## PARALLEL VOLTAGE REGULATORS WITH DIFFERENT OPERATING CHARACTERISTICS COLLECTIVELY FORMING A SINGLE REGULATOR WITH WIDE OPERATING RANGE

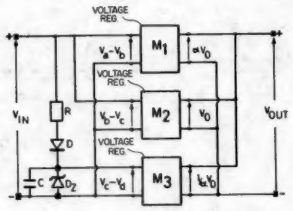
**Pietro Erratico, and Pietro Menniti, both of Milan, Italy, assignors to SGS-ATES Componenti Elettronici SpA, Agrate Brianza, Italy**

**Filed Jun. 12, 1984, Ser. No. 620,047**

**Claims priority, application Italy, Jun. 15, 1983, 21626 A/83**

**Int. Cl.⁴ G05F *1/59***

**U.S. Cl. 323—269** **4 Claims**




1. An integrated voltage regulator having first and second input terminals which are respectively connected to two poles of a voltage generator and having first and second output terminals, between which is established a voltage which is adjusted to predetermined constant values, said regulator comprising: a plurality of voltage regulator means, each having first and second input terminals which are respectively electrically connected to said first and second input terminals of said regulators, and each having first and second output terminals between which is established a constant voltage, said first and second output terminals of said regulator means being respectively connected to said first and second output terminals of said regulator, said regulator means being operable for voltages supplied to their input terminals having values included in predetermined value intervals, whose minimimum values are different from one another, wherein a voltage established between output terminals of each of said regulator means is held by each one of said regulator means at a predetermined constant value by means of an internal regulator means having feedback elements connected to its output terminals, said predetermined constant value being different for each one of said regulator means, wherein only one of said plurality of voltage regulator means is operative for any one value of input voltage to said regulator.

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**4,611,163**

## TEMPERATURE COMPENSATED RESISTANCE BRIDGE CIRCUIT

**David R. Madeley, Birmingham, England, assignor to Lucas Industries, England**

**Filed Feb. 25, 1985, Ser. No. 705,064**

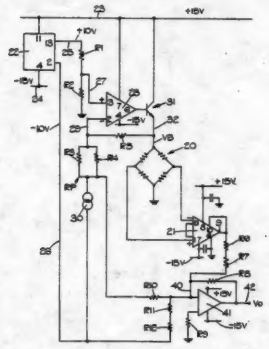
**Claims priority, application United Kingdom, Mar. 20, 1984, 8407192**

**Int. Cl.⁴ H03H *1/00***

**U.S. Cl. 323—367** **8 Claims**

1. A temperature compensated resistance bridge circuit, comprising a resistance bridge, means for applying a supply voltage across a first pair of opposite junctions of said bridge, a first amplifier for deriving a first output voltage from a second pair of opposite junctions of said bridge, means connected to one only of said first pair of terminals for modifying said supply voltage in dependence on the temperature of said bridge in a sense to oppose a change in sensitivity of the bridge with a change in the temperature thereof over a predetermined range, and means for deriving a second output voltage from

the sum of said first output voltage and a single control voltage which is dependent on the bridge temperature, in a sense to



maintain an offset error of the bridge substantially constant over said predetermined temperature range.

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**4,611,164**

## SPECTRUM ANALYZER WITH AUTOMATIC PEAK FREQUENCY TUNING FUNCTION

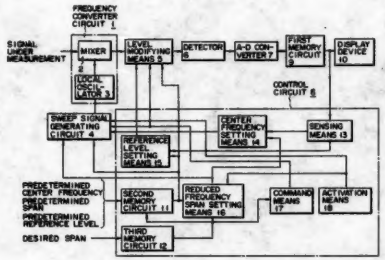
**Takano Mitsuyoshi, Tokyo, and Mamoru Ando, Hiratsuka, both of Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan**

**Filed Feb. 23, 1984, Ser. No. 583,047**

**Claims priority, application Japan, Feb. 27, 1983, 58-31154**

**Int. Cl.⁴ G01R *23/16***

**U.S. Cl. 324—77 B** **3 Claims**




1. A spectrum analyzer, comprising:

frequency converter circuit means comprising a local oscillator circuit and a mixer coupled to receive an output signal from said local oscillator circuit and an input signal whose spectrum is to be displayed, for converting said input signal to an intermediate frequency signal;

sweep signal generating means coupled to said local oscillator circuit to control the frequency thereof;

level modifying means coupled to receive said intermediate frequency signal from said frequency converter circuit means for controlling the level thereof;

detector circuit means coupled to receive said intermediate frequency signal from said level modifying means, for producing a detection signal representing the amplitude of said intermediate frequency signal;

analog/digital converter circuit means for converting said detection signal to digital data values;

first memory circuit means for storing said digital data values from said analog/digital converter circuit means;

display means for displaying the contents of said first memory circuit means; and

control circuit means coupled at least to said sweep signal generating means, to said level modifying means and to an output of said first memory circuit means for storing a predetermined initial frequency span, predetermined initial center frequency and a predetermined initial reference level, coupled to data input means operable to preset therein a desired frequency span value, and operable to first initiate generation of a signal from said sweep signal generating means whereby said local oscillator circuit output signal is first swept over a frequency range corresponding to said predetermined initial frequency span which is centered on said predetermined initial center frequency and whereby said level modifying means performs level control of said intermediate frequency signal in accordance with said predetermined initial reference level, with a plurality of levels of said intermediate frequency signal generated during said first sweep being converted into digital data values and successively stored in addresses of said first memory circuit means, said control circuit means further acting to determine from said digital data values of said first sweep the peak level of the frequency spectrum of said input signal within said predetermined initial frequency span and the frequency of said peak level and to set the value of said peak level as a reference level and to control said level modifying means such as to increase the gain or decrease the attenuation provided by said level modifying means in accordance with an amount of decrease of said reference level from said predetermined initial reference level, and further acting (a) to set the frequency of spectrum analyzer peak level as the center frequency of a second sweep, (b) to reduce the frequency span of said second sweep to be less than said predetermined initial frequency span by a predetermined factor and (c) to store the levels of said intermediate frequency signal resulting from said second sweep in said memory circuit means as digital data values and moreover (d) to determine from said digital data values the maximum level of said input signal spectrum during said second sweep and the frequency thereof and to set said maximum level to said reference level and said peak level frequency to be the center frequency of a succeeding sweep of reduced frequency span, and moreover to initiate a plurality of subsequent frequency sweeps with each of steps (a), (b), (c) and (d) above being performed for each of said subsequent sweeps with successively reduced values of frequency span, until said desired preset frequency span is attained, said control circuit means acting thereupon to initiate at least one frequency sweep with said preset desired frequency span as the frequency span thereof.

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**4,611,165**

## PULSE RF FREQUENCY MEASUREMENT APPARATUS

**Samuel E. Nussbaum, Sherburne, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 30, 1984, Ser. No. 595,162**

**Int. Cl.⁴ G01R *23/16***

**U.S. Cl. 324—77 B** **6 Claims**

1. A method of determining the RF carrier frequency of a first stream of pulses of an RF signal comprising the steps of:

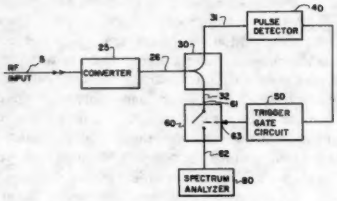
receiving said first stream of pulses;

deriving from said first stream of pulses a second stream of pulses having alternately occurring first and second pulses each having a carrier frequency directly related to said RF carrier frequency, and having

(i) a separation between sid first and second pulses substantially equal to the pulse period of said first stream of pulses plus a fixed time increment, and

(ii) a separation between said second pulse and an immedi-

ately following first pulse substantially equal to said pulse period less said fixed time increment; and




frequency analyzing said second stream of pulses to determine said RF frequency.

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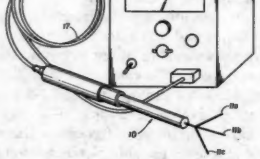
**4,611,166**

## RADIATION HAZARD DETECTOR

**Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.**

**Filed Dec. 20, 1982, Ser. No. 451,040**
**Int. Cl.[4] G01R** *21/04, 5/22, 21/10, 19/22*
**U.S. Cl. 324—95** **11 Claims**



7. An electric field sensitive probe comprising a set of sensing elements including a diode sensing element and a thermocouple sensing element, said diode sensing element being connected to a dipole and circuitry to exhibit a predetermined sensitivity to said field over a lower range of frequency, and said thermocouple sensing element exhibiting predetermined sensitivity to said field over a higher range of frequency, said lower and higher ranges being substantially adjacent to one another.

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**4,611,167**

## AUXILIARY WINDING FOR DRIVING ELECTRIC METER ACCESSORIES

**Christopher W. Ten Haagen, Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.**

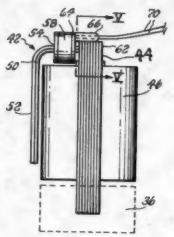
**Filed Mar. 14, 1985, Ser. No. 711,717**
**Int. Cl.[4] G01R** *31/02, 31/06;* **G08B** *21/00*
**U.S. Cl. 324—137** **8 Claims**

1. A voltage stator for an electric meter drive apparatus, said voltage stator being of a type having a voltage stator winding on a voltage stator core, comprising:

a flux shunt having a pickup plate adjacent a peripheral surface of said voltage stator winding;

a flux-return tab on said flux shunt;

means for providing a low-reluctance flux return path from said flux-return tab to said voltage stator core; and



an auxiliary coil on said flux-return tab, whereby return flux in said flux-return tab induces a voltage in said auxiliary coil.

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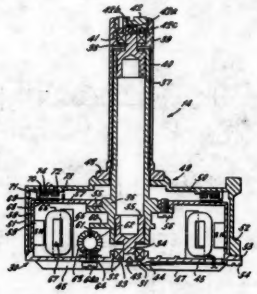
**4,611,168**

## MAGNETIC TACHOMETER ASSEMBLY

**Stefan Kudelski, Le Mont-sur-Lausanne, and Ernest Rosselet, Assens, both of Switzerland, assignors to Ampex Corporation, Redwood City, Calif. and Kudelski S.A., Lausanne, Switzerland**

**Filed Sep. 15, 1983, Ser. No. 533,902**
**Claims priority, application United Kingdom, Sep. 17, 1982, 8226573**
**Int. Cl.[4] G01P** *3/48, 3/54*
**U.S. Cl. 324—174** **11 Claims**



1. A tachometer for a rotary member which can rotate relatively to a support, said tachometer comprising:

a first ring carried for rotation with the rotary member and being mounted coaxially therewith;

a second ring mounted adjacent the first ring, aligned in axial register therewith, and mounted in fixed relation to the support, each of the rings being magnetically permeable and having correspondingly toothed peripheries disposed in close proximity and each coplanar with its respective ring, said rings defining an annular air gap axially positioned between the two rings;

a ring shaped magnetic member, disposed adjacent one of said rings and disposed coaxially relative thereto, for producing magnetic flux in said rings, said flux extending across the air gap throughout the peripheral regions of the rings to generate a compact flux path across the gap and the two rings, and

means for sensing variation in said flux as the rings rotate relative to each other.

## 4,611,169

## SENSOR FOR MEASURING RELATIVE MOVEMENT BETWEEN A VEHICLE AND A TRACK BY SENSING MAGNETIC FIELD DISTORTIONS

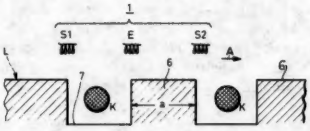
**Walter Hermann, Baldham, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany**

**Filed Oct. 24, 1983, Ser. No. 544,859**

**Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240478**

**Int. Cl.[4] G01B** *7/14*

**U.S. Cl. 324—208** **11 Claims**




**1**. An apparatus for measuring a relative movement between a magnetically levitated vehicle and a track on which said vehicle can travel, by sensing distortions in a magnetic field to produce measured values representing said relative movement comprising a rail (**4**) of magnetically conducting material with uniformly spaced teeth in said rail forming part of said track, magnetic sensor means carried by said vehicle, said sensor means comprising magnetic transmitter means including at least one alternating current energized transmitter coil for generating a magnetic field having normally undisturbed field line extending in a given direction, magnetic receiver means including at least one receiver coil for sensing said distortions, said magnetic receiver coil and said magnetic transmitter coil each having a respective preferred coil axis, said magnetic receiver coil being located in such a position in said generated magnetic field that said preferred axis of said magnetic receiver coil extends approximately perpendicularly to said undisturbed field lines, said coil axes being spaced from each other by a predetermined spacing, said coil axes being located in a common plane parallel to said rail for measuring said relative movement.

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## 4,611,170

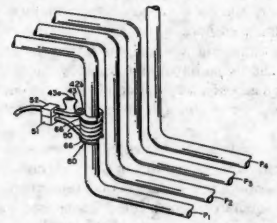
## COIL APPARATUS MOUNTED ON AN AXIALLY SPLIT SPOOL FOR INDICATING WALL THICKNESS VARIATIONS OF A LENGTH OF FERROMAGNETIC PIPE

**Roderic K. Stanley; Marvin Milewits; Robert C. Knauer, Jr., and James E. Bradfield, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex.**

**Division of Ser. No. 405,203, Aug. 4, 1982, Pat. No. 4,555,665. This application Jun. 24, 1985, Ser. No. 748,040**

**Int. Cl.[4] G01B** *7/10;* **G01R** *33/12;* **G01N** *27/72*

**U.S. Cl. 324—229** **2 Claims**




**1**. Apparatus for indicating wall thickness variations along a length of ferromagnetic pipe, comprising: an axially split spool mountable around the pipe and axially moveable relative thereto; a conduit comprising a multiplicity of individual insulated conductors, said conduit being wrappable around said spool to effectively surround said pipe; a connector block mechanically secured to each conduit end, each connector block having a multiplicity of electrical connections respectively electrically connected to the ends of said individual insulated conductors, whereby the juxtapositioning of said connector blocks establishes a series connection of all said individual conductors to provide a multiturn current flow path around the periphery of a discrete length of the pipe; means for supplying sufficient electrical current to said multi-turn current flow path to achieve magnetic flux saturation of at least the length of pipe encompassed by said spool; three voltage generating pickup coils mounted on said spool in axially adjacent relationship; means for generating a voltage signal responsive to the axial position of said spool relative said pipe; means for indicating the voltage generated in the center one of said voltage generating pickup coils as a function of said voltage signal; means for series connecting the two end voltage generating pickup coils in opposition; and means for indicating the differential voltage produced in said two end voltage generating pickup coils by movement of said spool relative to the pipe as a function of said voltage signal.

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## 4,611,171

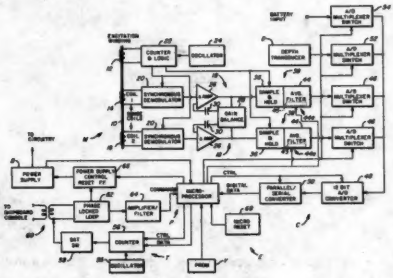
## LOCATION INDICATOR FOR A MARINE SEISMIC CABLE COMPRISING OPERATOR CONTROLLED SATURABLE CORE MAGNETOMETERS

**Theodore E. Woods, Houston, Tex., assignor to Syntron, Inc., Houston, Tex.**

**Filed Jun. 7, 1983, Ser. No. 501,809**

**Int. Cl.[4] G01R** *33/04;* **G01V** *1/38;* **G01C** *17/28*

**U.S. Cl. 324—253** **6 Claims**



**1**. A cable location apparatus for indicating the location of a long marine seismic cable being towed behind a vessel, comprising:

(a) means for sensing a magnetic vector indicative of the earth's magnetic field in the vicinity of the cable, said sensing means including:

(1) saturable ferromagnetic core;

(2) excitation winding means for driving said core into saturation;

(3) first and second sensor coil means located in guadrature relation to each other on said core for sensing first and second components, respectively, of the earth's magnetic vector in the vicinity of the cable;

(4) said first and second sensor coil means each generating analog electrical signals in response to the sensed magnetic vector components;

(b) an analog processing circuit coupled to said first and second sensor coil means to receive said analog signals and for generating averaged analog signals, said analog processing circuit including operator controlled means to vary the time during which said analog signals are averaged;

(c) converter circuit means for converting said averaged analog electrical signals into digital signals indicative of the components of the earth's magnetic vector in the vicinity of the cable;

(d) means for transmitting said digital signals to said vessel and for receiving command instructions from said vessel; and

(e) a stored program processor means operatively coupled to said converter circuit means and said transmitter means, said processor means operating in response to a series of instructions for controlling the operations of said converter circuit means and said transmitter means, said processor means including memory means for storing said series of instructions and providing said instructions, decoding means for decoding said instructions to generate commands, and addressing means for addressing said memory means in response to said commands.

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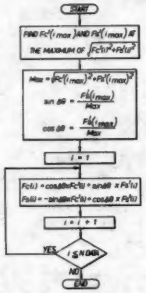
## 4,611,172
## RECEPTION SIGNAL PROCESSING APPARATUS IN NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

**Hidetomo Takase, Yaita, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Aug. 29, 1983, Ser. No. 527,565**
**Claims priority, application Japan, Aug. 28, 1982, 57-149773**
**Int. Cl.[4] G01R *33/08***
**U.S. Cl. 324—314** **5 Claims**



**1**. A reception signal processing method for use in a nuclear magnetic resonance diagnostic apparatus to display as an image the distribution of the spin density or relaxation time of specified atomic nuclei existing in an object utilizing the magnetic resonance phenomena and resultant nuclear magnetic resonance signal, the reception signal processing method comprising the steps of:

demodulating a nuclear magnetic resonance signal using two reference waves, the phases of which are different from one another by 90°, to produce two demodulated nuclear magnetic resonance signals Fc'(t) and Fs'(t);

digitalizing said two demodulated signals obtained by said step of demodulating to produce two digitized signals Fc'(i) and Fs'(i);

summing $Fs'(i)^2$ and $Fc'(i)^2$ at discrete time intervals i and determining for what value of i="i max" the term "Max" is at a maximum value, where

$$\text{Max} = \sqrt{Fs'(i\text{max})^2 + Fc'(i\text{max})^2} \ ;$$

finding the phase difference $\Delta\theta$ between the reference waves and nuclear magnetic resonance signal by using one of the relationships:

$$\Delta\theta = \sin^{-1}\left(\frac{Fs'(i\text{max})}{\text{Max}}\right) \ ;$$

$$\Delta\theta = \cos^{-1}\left(\frac{Fc'(i\text{max})}{\text{Max}}\right) \ ;$$

$$\Delta\theta = \tan^{-1}\left(\frac{Fs'(i\text{max})}{Fc'(i\text{max})}\right) \ ;$$

phase correcting said digitalized signals Fc'(i) and Fs'(i) using $\Delta\theta$ to thereby obtain Fc(i) and Fs(i); and

employing Fc(i) and Fs(i) to display as an image the distribution of the spin density or relaxation time of said specified atomic nuclei.

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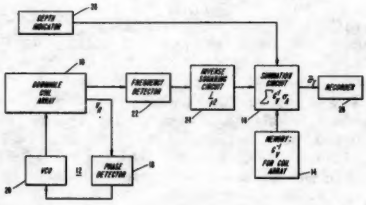
## 4,611,173
## INDUCTION LOGGING SYSTEM FEATURING VARIABLE FREQUENCY CORRECTIONS FOR PROPAGATED GEOMETRICAL FACTORS

**Frank R. Bravenec, Houston; Hugh E. Hall, Jr., Huntsville; Gulamabbas A. Merchant, and Suresh G. Thadani, both of Houston, all of Tex., assignors to Halliburton Company, Duncan, Okla.**

**Filed Jan. 11, 1983, Ser. No. 457,149**
**The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.**
**Int. Cl.[4] G01V *3/18*; G06F *15/50*; G06G *7/76***
**U.S. Cl. 324—339** **11 Claims**



**11**. An induction well logging apparatus comprising:

a transmitter and receiver coil system adapted to be moved through a well bore;

means for imposing a signal on a transmitter coil in said system the signal having a frequency selected to maintain a voltage across a receiver coil in said system substantially constant as the coil system is moved through the well bore;

means for measuring said selected frequency as a function of the depth of the apparatus in the well bore;

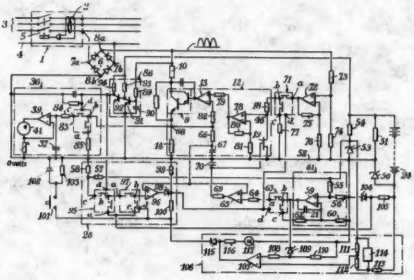
means for providing a data signal related in value to the inverse square of said selected frequency; and

means for operating on said data signal with the inverse vertical response function of the coil system to obtain a signal related in value to the actual conductivity of the formation of selected thickness at the depth of investigation.

## 4,611,174
## DEVICE FOR GENERATING AN AC RAMP FOR CHECKING THE TRIPPING CURRENT OF A CIRCUIT-BREAKER

**Daniel Arnoux, St Germain en Laye; Claude Genter, Paris, and Jean Bousquet, Domont, all of France, assignors to Societe en Commandite par Actions dite: Chauvin Arnoux, Paris, France**

**Filed Jan. 30, 1984, Ser. No. 574,896**
**Claims priority, application France, Feb. 1, 1983, 83 01523**
**Int. Cl.[4] G01R *31/32***
**U.S. Cl. 324—424** **9 Claims**



1. A device for generating an AC current ramp for checking the tripping current of a circuit-breaker connected to an AC voltage network, comprising a bridge rectifier having first and second pairs of terminals, said first pair of terminals being connectible respectively to an active terminal of the AC voltage network situated downstream of the circuit-breaker and to a neutral wire of said network, a load circuit connected to said second pair of terminals of the bridge rectifier, said load circuit being formed mainly by a power transistor in series with a measuring resistor, a high gain amplifier having an output connected to a control electrode of said power transistor and a first input which receives at least a part of a voltage appearing at the terminals of the measuring resistor, an auxiliary battery, a capacitor charged from said auxiliary battery, a field effect transistor driven by a voltage dependent on a voltage at the terminals of said capacitor, said field effect transistor having a conduction resistance forming with a resistor a potentiometric divider whose middle point is connected to a second input of the high gain amplifier, the potentiometric divider being connected to said second pair of terminals of the bridge rectifier, said device further comprising a constant current generator which is fed with current by the auxiliary battery for charging said capacitor, and a comparator amplifier having a first input which is connected to the capacitor, a second input which is connected to a junction point between the measuring resistor and the power transistor, and an output which is connected to the gate of said field effect transistor.

## 4,611,175
## PIPE CORROSION MONITOR

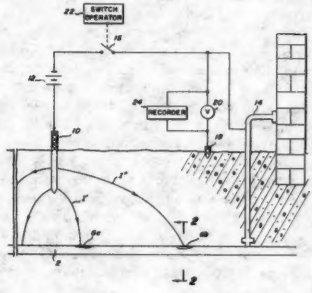
**Ashok Kumar, Champaign; Ellen G. Segan, and John M. Bukowski, both of Urbana, all of Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 22, 1984, Ser. No. 592,140**
**Int. Cl.[4] G01N *27/42***
**U.S. Cl. 324—425** **9 Claims**

1. The method for measuring the amount of corrosion occuring since placement of a metalic object which is coated with a non-conductive, corrosion-resistant protective layer, said object being buried in situ in the soil, which comprises the steps of:

(a) introducing an electrode into the soil adjacent said object;

(b) applying a direct-current potential between said electrode and said object, thereby establishing a current path from said electrode to the object via the soil and at least one opening produced in the protective layer of the corrosion of a given area of said object, thereby electrically charging the object to a given level relative to electrical ground;

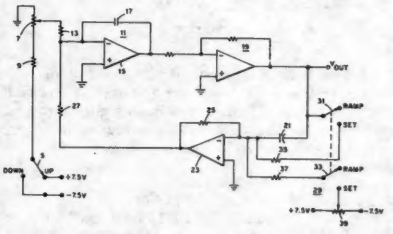


(c) opening the current path after the charge on said object reaches said given level; and measuring the transient decay of the charge, thereby providing an indication of the amount of corrosion of the object occuring since placement.

## 4,611,176
## PRECISION LINEAR RAMP FUNCTION GENERATOR

**W. Bruce Jatko, Knoxville; David R. McNeilly, Maryville, and Louis H. Thacker, Knoxville, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Filed Aug. 1, 1984, Ser. No. 636,657**
**Int. Cl.[4] H03K *4/10, 4/84***
**U.S. Cl. 328—184** **1 Claim**



1. A ramp function generator, comprising:

a voltage integrator having an input and an output;

a constant voltage generating means for selectably generating and applying either a positive or negative constant voltage to the input of said integrator corresponding to a desired positive or negative ramp function at the output of said integrator;

a differentiator feedback circuit connected between the output and input of said integrator for generating and applying a feedback voltage in a negative feedback arrangement corresponding to the derivative of the output ramp rate of said integrator to alter the input voltage to said integrator in a manner to force a linear output at the selected ramp rate, said differentiator feedback circuit comprising an operational amplifier having an input and an output connected to the input of said integrator, a series capacitor connected between the output of said integrator and the input of said operational amplifier and a feedback

resistor connected between the output and input of said operational amplifier; and

a selector switch comprising first and second ganged switches, a variable setpoint voltage source, and first and second summing resistors each having one end connected to the input of said operational amplifier, said first switch connected between the output of said integrator and the other end of said first summing resistor and said second switch connected between said setpoint voltage source and the other end of said second summing resistor so that when said swtiches are switched to the closed position corresponding to a set position of said selector switch the output voltage of said integrator is summed with a selected setpoint voltage from said setpoint voltage source at the input of said operational amplifier to generate an error voltage signal at the output of said operational ampifier which alters the input voltage to said integrator sufficient to force the output voltage of said integrator to hold at a baseline voltage level corresponding to said setpoint voltage level and when said switches are switched to the open position corresponding to a ramp position of said selector switch said ramp function is generated beginning from said baseline voltage level.

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**4,611,177**

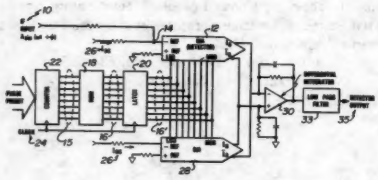
## SIGNAL DEMODULATOR USING A MULTIPLYING DIGITAL-TO-ANALOG CONVERTER

**Robert G. Dildine, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 569,699, Jan. 9, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,234**

**Int. Cl.[4] H03D** *3/06*

**U.S. Cl. 329—50** **10 Claims**



7. A method of demodulating an analog signal comprising the step of multiplying said analog signal with a periodic digital demodulation signal in a multiplying digital-to-analog converter to provide a demodulated output signal in response to said analog and demodulation signals.

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**4,611,178**

## PUSH-PULL OUTPUT CIRCUIT

**Jimmy R. Naylor, and David F. Mietus, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.**

**Filed May 8, 1985, Ser. No. 732,168**

**Int. Cl.[4] H03F** *3/30*

**U.S. Cl. 330—272** **12 Claims**

1. A push-pull output circuit comprising:

(a) a pullup transistor having a collector coupled to a first supply voltage conductor and an emitter coupled to an output conductor;

(b) a pulldown transistor having a collector coupled to the output conductor and an emitter coupled to a second supply voltage conductor;

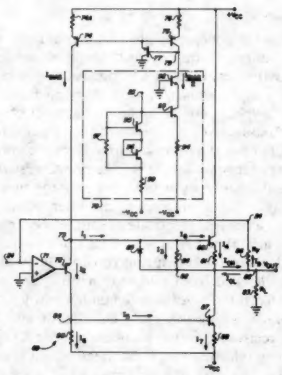
(c) first circuit means responsive to an output voltage of the output conductor for increasing the collector-to-emitter breakdown voltage of the pulldown transistor to a level that exceeds the voltage difference between the output conductor and the second supply voltage conductor by reducing the base-to-emitter voltage of the pulldown transistor to a sufficiently low level to reduce the current in the pulldown transistor to a very low level and providing a path having a predetermined resistance that is low enough to cause the collector-base reverse leakage current to flow out of the base of the pulldown transistor;

(d) second circuit means responsive to the output voltage for increasing the collector-to-emitter breakdown voltage of the pullup transistor to a level that exceeds the voltage difference between the output conductor and the first supply voltage conductor, by reducing the base-to-emitter voltage of the pullup transistor to a sufficiently low level to reduce the current in the pullup transistor to a very low level and by providing a path having a predetermined resistance that is low enough to cause the collector-base reverse leakage current to flow out of the base of the pullup transistor;

(e) bias current means for producing a bias current that is essentially constant with respect to the output current in the output conductor; and

(f) means for supplying a first portion of the bias current to a first conductor coupled to the base of the pullup transistor, and supplying a second portion of the bias current to a second conductor coupled to the base of the pulldown transistor

wherein the second circuit means includes first feedback means coupled between the emitter and base of the pullup transistor



for increasing the first portion of the bias current, and thereby reducing the second portion of the bias current, as output current supplied by the pullup transistor increases, the reduced second portion of the bias current substantially reducing the base-to-emitter voltage of the pulldown transistor;

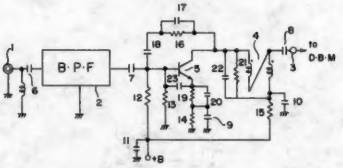
wherein the first circuit means includes means coupled between the emitter and base of the pulldown transistor for increasing the second portion of the bias current as output current sunk by the pulldown transistor increases, thereby reducing the first portion of the bias current and substantially reducing the base-to-emitter voltage of the pullup transistor;

wherein the bias current means includes means for decreasing the bias current as temperature of the push-pull output circuit increases, the bias current decreasing means including a current mirror current source controlled by a current control circuit, the current control circuit including first and second series-connected diodes in parallel connection with a path including the emitter-base junction of a first transistor connected in series with a first resistor, and also in parallel connection with a second resistor, the resulting voltage drop across the first resistor controlling the value of the bias current.

## 4,611,179
## WIDE-BAND TYPE HIGH-FREQUENCY AMPLIFIER CIRCUIT

Syuuji Matsuura, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1985, Ser. No. 741,472
Claims priority, application Japan, Jun. 5, 1984, 59-83771
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—293 13 Claims




1. A wide-band type high-frequency amplifier circuit comprising:

transistor means for amplifying a wide-band type high frequency signal, said transistor means having a base, collector and emitter;

first frequency responsive reactance means, operatively connected across the base and collector of said transistor means for providing voltage feedback to said transistor means;

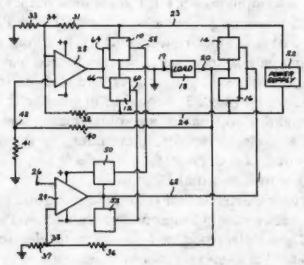
second frequency responsive reactance means, operatively connected across the base and the emitter of said transistor means, for providing current feedback wherein said second frequency responsive reactance means consists essentially of a parallel connection of a resistance and a condenser; and

a parallel resonance circuit connected to the collector of said transistor means.

## 4,611,180
## GROUNDED BRIDGE AMPLIFIER PROTECTION THROUGH TRANSISTOR THERMO PROTECTION

Gerald R. Stanley, Mishawaka, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Jan. 9, 1985, Ser. No. 689,916
Int. Cl.[4] H03F *3/26;* H02H *5/04*
U.S. Cl. 330—298 4 Claims

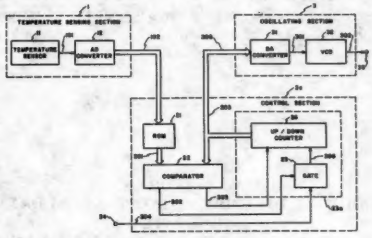



1. In a bridge amplifier having a protection circuit, said bridge amplifier including a first paired output stage and second paired output stage, means for connecting a load between said first and second paired output stages, means for connecting a power supply to said first and second paired output stages to form a bridge circuit, first and second drive amplifiers, said first drive amplifier coupled to said first paired output stage, said second drive amplifier coupled to said second paired output stage, said first drive amplifier for receiving an input signal to drive said first paired output stage, said second drive amplifier for receiving an input signal responsive to the driven output of said first paired output stage to cause said second paired output stage to act in a balancing manner, the improvement comprising means for sensing an operating temperature of each output stage of one of said first and second paired output stages, and means in response to selected maximum of each sensed operating temperature for reducing the drive output of said first drive amplifier.

## 4,611,181
## TEMPERATURE COMPENSATED OSCILLATOR WITH REDUCED NOISE

Yukio Fukumura, and Takashi Matsuura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,148
Claims priority, application Japan, Sep. 10, 1984, 59-189138
Int. Cl.[4] H03L *1/02*
U.S. Cl. 331—66 9 Claims




1. A temperature-compensated oscillator device comprising:

temperature sensing section means including temperature sensor means for sensing an ambient temperature to provide a temperature data signal representative of the sensed temperature, analog-to-digital converter means for converting the temperature data signal into a first digital signal having a first variable digital value;

control section means for converting the first digital signal into a second digital signal having a second digital value, the control section means comprising first means for converting a variation in the first digital value into a plurality of time-divided fractional variations in the second digital value; and

oscillating section means including a converter means for converting the second digital signal into a frequency control signal, and voltage-controlled oscillator means responsive to the frequency control signal for changing the oscillation signal frequency.

## 4,611,182
## METHOD AND DEVICE FOR CONTROLLING THE HEATING OF A THERMOSTATICALLY CONTROLLED ENCLOSURE FOR AN OSCILLATOR

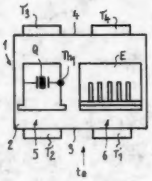
Jacques Chauvin, Sartrouville, and Patrice Canzian, Argenteuil, both of France, assignors to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E., Argenteuil, France

Filed Oct. 15, 1984, Ser. No. 661,049
Claims priority, application France, Oct. 18, 1983, 83 16549
Int. Cl.[4] H03L *1/04*
U.S. Cl. 331—69 15 Claims

1. A method for regulating the heating of a thermostatically controlled enclosure of an oscillator, of which the heating is provided by a plurality of heating elements controlled to cause the measured temperature of the enclosure to correspond to a reference temperature, which comprises the following steps:

a - subjecting the thermostatically controlled enclosure to an external temperature close to the maximum temperature of the temperature range specified for the enclosure, and measuring the frequency of the oscillator;

b - subjecting the thermostatically controlled enclosure to an external temperature close to the minimum temperature of the temperature range specified for the enclosure and cancelling out the difference in the frequency of the oscillator from the frequency measured previously, by modifying the distribution of the powers dissipated by the different heating elements, with the result that the uniformity defects of the temperature within the enclosure are compensated at least partially throughout the operating temperature range of the oscillator.



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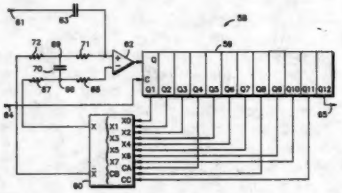
**4,611,183**

## DIGITAL DECORRELATING RANDOM DATA GENERATOR

**Gerald V. Piosenka, Scottsdale, and Barry B. Mead, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 30, 1984, Ser. No. 605,366**
**Int. Cl.[4] H03B *29/00***
**U.S. Cl. 331—78** **28 Claims**



1. A randomizer device, having a noise input, a clock input and an output, said randomizer comprising:

feedback means for producing a feedback signal, said feedback means having an input, a clock input, a first output, a second output and a third output, said clock input being coupled to said clock input of said randomizer device and said third output being coupled to said output of said randomizer device;

a comparator having a first input, a second input and an output, said first input being coupled to said noise input of said randomizer means and said output being coupled to said input of said feedback means; and

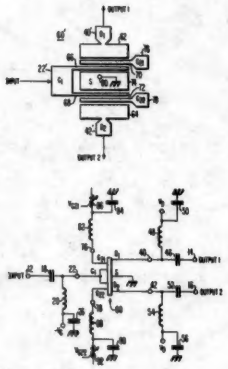
coupling means for coupling said first and second inputs of said comparator providing a balanced DC voltage and reducing the ripple voltage to said comparator, said coupling means having a first input, a second input, a first output and a second output, said first input being coupled to said first output of said feedback means, said second input being coupled to said second output of said feedback means, said first output being coupled to said first input of said comparator and said second output being coupled to said second input of said comparator.

**4,611,184**

## MICROWAVE FREQUENCY POWER DIVIDER

**Mahesh Kumar, So. Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.**

**Filed Jul. 13, 1984, Ser. No. 630,840**
**Int. Cl.[4] H03H *11/36***
**U.S. Cl. 333—100** **1 Claim**



1. A radio frequency signal power divider comprising, in combination:

a double field-effect transistor (FET) comprising a common source, first and second drain electrodes, and first, second, third and fourth gate electrodes being coupled together for receiving a signal of power P to be divided in power, each of said first and second drain electrodes being responsive to input power P for generating output power P1 and P2, respectively, which each of P1 and P2 being a fraction of said input power, said FET having means for receiving gate-source bias and drain-source bias of values such that, when said gate-souce bias and drain-source bias are present P1 plus P2 is equal to or greater than P;

means providing adjustable gate-source bias to said third and fourth gate electrodes for determining, by the amount of gate-source bias applied to each electrode, the fraction that P1 is to P and that P2 is to P,

said first gate electrode and third gate electrode being positioned between said common source and first drain said second gate electrode and fourth gate electrode being positioned between said common source and said second drain, said first and second gate electrodes being relatively nearer to said common source, said third and fourth gate electrodes being relatively nearer to said first drain and second drain electrodes, respectively; and

a gallium arsenide substrate, said electrodes being on one side of said gallium arsenide substrate, said source being connected through said gallium arsenide substrate by means of a via hole to the side of the gallium arsenide substrate opposite that which contains said gate, source and drain electrodes.

## 4,611,185
## ELECTRICAL NOISE FILTER

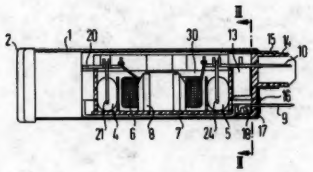
**Josef Dirmeyer, Bodenwöhr-Neuenschwand; Hans Kinzler; Karlheinz Lahner, both of Regensburg, and Hans-Werner Schulz, Wenzenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Mar. 29, 1984, Ser. No. 594,655**

**Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315036**

**Int. Cl.[4] H03H** *7/01, 1/00*

**U.S. Cl. 333—167** **4 Claims**




1. An electrical interference filter of the type having an external filter housing of highly conductive metal containing an additional insulating material housing filled with a sealing compound of insulating material, the insulating material housing being inserted into the external filter housing and having embedded electrical filter components therein interconnected in circuit relationship to form the filter circuit, the filter comprising:

plug connectors having outer connection elements extending from one end of the insulating material housing serving as ports of the filter circuit, the external filter housing being shaped to include a partially closed face end having an apertured portion of reduced cross section for containing the outer connection elements arranged in the interior of the filter housing;

a ground conductor extending over the entire length of the insulating material housing in the external filter housing having an external connection part extending through a closed area of the face end of the external filter housing and electrically connected with the external filter housing at one location in a conducting manner; and

the apertured portion of the external filter housing being extended beyond the face end in the form of a rectangular shaft and encircling the outer connection elements located within this rectangular shaft portion of the external filter housing section and shielded electromagnetically.

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## 4,611,186
## NONCONTACTING MIC GROUND PLANE COUPLING USING A BROADBAND VIRTUAL SHORT CIRCUIT GAP

**Bernhard A. Ziegner, Westford, Mass., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 530,291, Sep. 8, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,519**

**Int. Cl.[4] H01P** *5/00*

**U.S. Cl. 333—246** **4 Claims**

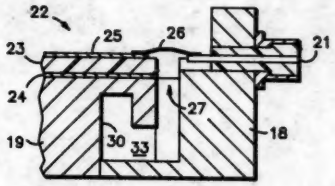
1. An apparatus for electrically coupling to a ground plane of an MIC comprising:

a first conductive member, said MIC being mounted thereon with said ground plane in contact therewith, said ground plane being substantially coincident with an edge of said first member in a coupling region, said first conductive member having a first cavity portion;

a second conductive member having a second cavity portion, said second conductive member being abutted against said first conductive member to provide that said first and second cavity portions combine to form;

a gap between said first and second conductive members at said coupling region;

a first waveguide section having a first end coincident with said gap;




and a second waveguide section, said first and second wave guide sections combining to cause a broadband virtual short across said gap, whereby said ground plane is electrically coupled to said second conductive member across said gap.

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## 4,611,187
## CIRCUIT BREAKER CONTACT ARM LATCH MECHANISM FOR ELIMINATING CONTACT BOUNCE

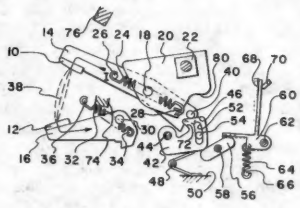
**Claudio Banfi, Rovello Porro, Italy, assignor to General Electric Company, New York, N.Y.**

**Filed Feb. 7, 1985, Ser. No. 699,271**

**Claims priority, application Italy, Feb. 15, 1984, 19615 A/84**

**Int. Cl.[4] H01H** *77/06*

**U.S. Cl. 335—16** **8 Claims**




1. A contact arrangment for eliminating contact bounce in current limiting circuit breakers comprising:

a pair of parallel spaced contact arms having a pair of separable contacts arranged at a first end, said contacts being held in a closed position by a pair of contact springs, said contact arms being pivotally mounted within a circuit breaker enclosure to rotate to a first open position independent of an operating mechanism under the influence of magnetic repulsion generated by excess current transport in opposite direction through said contact arms;

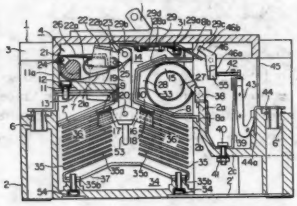
a first lever operatively connected with said operating mechanism for rotating one of said contact arms to a second open position after said contact arms are rotated by said magnetic repulsion; and

a second lever pivotally mounted within said circuit breaker enclosure against the bias of a first return spring and operatively abutting a second end of said one contact arm opposite said first end and having a camming surface for receiving a cam pin when said one contact arm is rotated to said first open position.

## 4,611,188
## CIRCUIT BREAKER

Wasaburo Murai, Osaka, and Takeshi Yura, Habikino, both of Japan, assignors to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1985, Ser. No. 707,687
Claims priority, application Japan, Mar. 9, 1984, 59-43860
Int. Cl.[4] H01H *83/00*
U.S. Cl. 335—16 6 Claims



1. A circuit breaker comprising:

first and second fixed contact devices disposed at each pole and insulated from each other, said first and said second fixed contact devices having first and second fixed contacts respectively;

a movable contact arm having first and second movable contacts which are respectively associated with said first and said second fixed contacts, said movable contact arm bridging between said first and said second fixed contacts in a closed circuit state to flow current in an opposite direction to the current which flows near said first and said second fixed contacts;

a supporting rod having said movable contact arm at one end thereof, and being supported so that it can be guided to open or close a circuit;

a cross bar having arms insulated at every pole, said cross bar controlled to be capable of opening-closing the circuit and tripping by means of a trip-free mechanism;

a movable contact link whose one end is rotatably supported on said arms and whose other end is rotatably connected to the other end of said supporting rod;

a toggle spring supported so as to constitute a dead center link mechanism between said arms and said movable contact link so that said movable contacts can press on said fixed contacts in a closed circuit state;

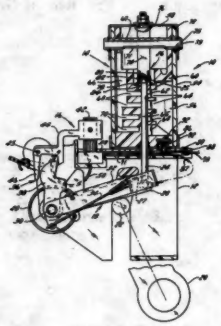
a trip bar being common to all poles, said trip bar making a latch mechanism in said trip-free mechanism do the tripping action; and

a set of electromagnetic devices in which a winding passing the current of a main circuit is wound, wherein a movable portion in said electromagnetic device has a first portion which engages a part of said trip bar to release a trip mechanism, and second portion which engages said supporting rod to open said movable contact arm to the vicinity of dead center, and wherein said movable contact arm has a position of stop of opening said contacts at which the force of said toggle spring reverses over said dead center, and wherein, during a short-circuit, an electromagnetic repulsive force generated between said fixed and said movable contacts and an attaction force of said electromagnetic device directly open said movable contact arm to said position of stop of opening against the contacting force of said toggle spring to break the circuit.

## 4,611,189
## UNDEROIL PRIMARY CIRCUIT BREAKER

Harvey W. Mikulecky, Oconomowoc, Wis., assignor to RTE Corporation, Brookfield, Wis.

Filed Feb. 7, 1985, Ser. No. 699,349
Int. Cl.[4] H01H *75/12, 77/04*
U.S. Cl. 335—37 19 Claims



1. An arc interruption assembly for an oil immersible primary circuit breaker having a fixed contact, a movable contact, and a trip-free latch mechanism for moving said movable contact into engagement with said fixed contact, said interruption assembly comprising

a casing having a core defining first and second chambers within said casing, and

an arc passage in said core connected to said first chamber, said fixed contact being located at one end of said arc passage and the movable contact being mounted in said arc passage for movement into engagement with the fixed contact,

a second passage in said core connected to said second chamber,

a first exhaust port connecting said arc passage to said second passage, a second exhaust port connecting said arc passage to said second passage and

frangible means in said second exhaust port for opening said second exhaust port in response to high pressure gases created by a primary fault arc in said interrupter and

means in said second chamber for venting low pressure gases from said second chamber.

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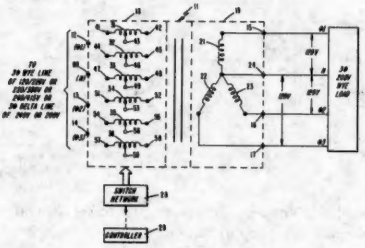
## 4,611,190
## APPARATUS FOR TRANSFORMING MULTIPHASE POWER OF DIFFERENT PHASE TO PHASE LINE LEVELS INTO MULTIPHASE POWER HAVING A SINGLE PHASE TO PHASE VOLTAGE LEVEL

Herbert R. Montague, Binghamton, N.Y., assignor to Control Concepts Corporation, Binghamton, N.Y.

Filed Mar. 6, 1985, Ser. No. 709,408
Int. Cl.[4] H01F *33/00*
U.S. Cl. 336—10 12 Claims

1. Apparatus for transforming N phase power susceptible of having different predetermined phase to neutral and phase to phase line voltage levels, in wye and delta configurations into N phase power having a single predetermined line to line voltage level in one of said configurations, the transformation being reversible, where N is an integer greater than 2, comprising an N phase transformer having primary winding means and a secondary winding connected in said one configuration, said primary winding means including a neutral terminal and P coils for each phase, where P is an integer greater than 1, each of said coils including first and second end terminals and a single intermediate tap, the intermediate tap on each coil being at the same predetermined point along the coil, and means for:

(a) selectively connecting said coils of phase k in series with each other so the second end terminal of a first coil of phase k is connected to the first end terminal of the P coil of phase k and for selectively connecting the P coils of phase k in parallel with each other so the first end terminals of the P coils of phase k are connected to each other and the second end terminals of the P coils of phase k are connected to each other, where k is selectively every one of 1 . . . N, and (b) selectively connecting the second terminal of the P coil of every phase to the neutral



terminal for the wye configuration and a first of the predetermined voltages, and (c) selectively connecting a second end terminal of the P coil of one phase and the taps of the P coil of other phases to the neutral terminal for the wye configuration and a second of the predetermined voltages, and (d) selectively connecting the end terminals of the first coil of phase k to at least one line for each phase, and (e) selectively connecting a tap of the first coil of at least one phase to at least one line while connecting the first end terminals of the first coil of other phases to at least one line for other phases.

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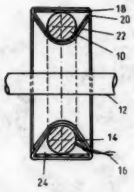
**4,611,191**

## NON-MAGNETIC CORE CURRENT SENSOR

**Claude Souchere, Grenoble, France, assignor to Merlin Gerin, Grenoble Cedex, France**

**Filed May 7, 1985, Ser. No. 731,268**
**Claims priority, application France, May 21, 1984, 84 08000**
**Int. Cl.[4] H01F *15/04***
**U.S. Cl. 336—84 R** **6 Claims**



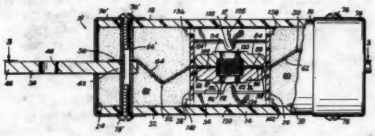

1. Current sensor comprising a ring core made of a non-magnetic material, a primary winding constituted by a conductor running through said core, a secondary winding constituted by a turn wound on the core, an internal electrostatic shield made of a non-magnetic conducting material inserted between the primary conductor and the non-magnetic core with the secondary winding and an external magnetic shield enclosing the core with the secondary winding.

**4,611,192**

## HEAVY-DUTY TIME-DELAY FUSE

**Guru B. Arora, N. Arlington, N.J., assignor to Eagle Electric Mfg. Co., Inc., Long Island, N.Y.**

**Filed Jan. 25, 1985, Ser. No. 694,802**
**Int. Cl.[4] H01H *71/20, 85/04***
**U.S. Cl. 337—165** **14 Claims**



1. A heavy-duty, time-delay fuse, comprising:

(A) an elongated, hollow, tubular housing having opposite end regions and bounding an interior space;

(B) a pair of electrically-conducting terminals, each being located at, and extending outwardly past, a respective end region of the housing;

(C) a pair of elongated, fusible links, each being located within the interior space and extending between a first end region which is electrically connected to a respective terminal, and a second end region which has opposite abutment surfaces, the second end regions being longitudinally spaced apart from each other,

(i) each link being constituted of an electrically-conducting material for enabling an electrical current conducted between the terminals to flow along the links, and each link at least partially resisting the electrical current flow for generating heat in an amount proportional to the magnitude of the electrical current flow;

(D) a pair of heat sinks located within the interior space and having generally planar, juxtaposed, contact surfaces facing each other in a mutual parallelism, each contact surface being located at, and normally interconnected by a eutectically soldered bond to, respective abutment surfaces of both links,

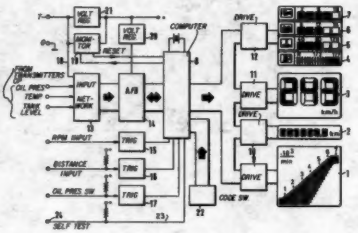
(i) each heat sink extending longitudinally between the spaced-apart second end regions and being constituted of an electrically-conducting material for enabling the electrical current to flow along the heat sinks, and for at least partially absorbing and dissipating the heat amounts generated by the links, each eutectically soldered bond being meltable at a predetermined melting point; and

(E) biasing means located within the interior space, and operative for urging the contact surfaces apart from each other in a direction generally perpendicular to the planes in which the contact surfaces lie, and for maintaining the contact surfaces apart and in said mutual parallelism, in the event of an overload condition in which an overload electrical current having a magnitude above that of a rated electrical current is conducted between the terminals and causes the links to generate heat in an overload amount exceeding said predetermined melting point and sufficient to melt the eutectically soldered bonds between the contact surfaces and the respective abutment surfaces after a predetermined time delay proportional to the amount of heat absorbed and dissipated by the heat sinks.

## 4,611,193
## ELECTRIC DISPLAY DEVICE OF A VEHICLE

**Ulrich Brüggemann, Oberursel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 7, 1984, Ser. No. 648,449**
**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332385**
**Int. Cl.[4] B60Q *1/00***
**U.S. Cl. 340—52 F** **8 Claims**



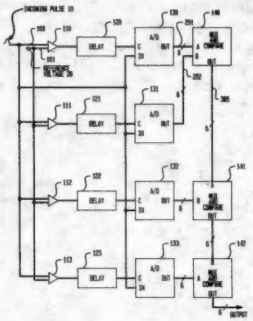
1. An electric display device suitable for a plurality of vehicles, particularly motor vehicles having one or more differing characteristics of construction including number of cylinders and final drive gear ratios, said display device comprising:
at least one indicating instrument;
a memory which stores at least one desired display value of said construction characteristics;
means for setting said indicating instrument to said display value of said memory in a testing mode, said setting means including switch means for the switchable division of a rate of pulses of a variable to be indicated, particularly a speed of rotation, and wherein
said memory stores, for display of a preset division of pulse rate, at least two desired display values; and wherein
a display in each case of the of the stored desired display values on said indicating instrument is switchable by means of said switch means.

## 4,611,194
## ANALOG-TO-DIGITAL CONVERTER

**Charles E. Konig, Staten Island, N.Y., and William J. Skudera, Jr., Eatontown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Aug. 16, 1985, Ser. No. 766,371**
**Int. Cl.[4] H03M *1/12***
**U.S. Cl. 340—347 SH** **7 Claims**

1. Apparatus for providing an analog-to-digital conversion of an analog signal which comprises:
means for detecting the analog signal at at time and generating a multiplicity of strobe signals,
means for delaying each strobe signal by successively greater predetermined amounts from the time,
a multiplicity of means for sampling the analog signal and providing a digital representation of the sample, each of the samples being obtained in response to at least one of the strobe signals, and

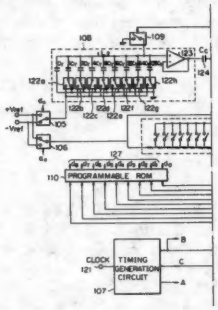


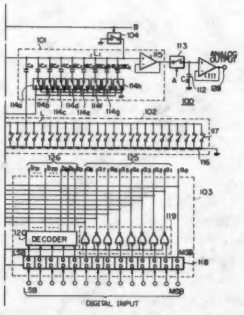
means for computing the analog-to-digital conversion in response to the multiplicity of digital representations.

## 4,611,195
## DIGITAL-TO-ANALOG CONVERTER

**Tsukagoshi Shosaku, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Dec. 18, 1984, Ser. No. 683,191**
**Claims priority, application Japan, Dec. 21, 1983, 58-239621**
**Int. Cl.[4] H03M *1/12***
**U.S. Cl. 340—347 DA** **7 Claims**





1. A digital-to-analog converter comprising:
(a) a first array of capacitors for generating an analog volt-

age corresponding to the code value of a digital input signal;

(b) a resistive voltage divider for dividing a reference voltage and for applying a divided voltage to said first array of capacitors;

(c) a second array of capacitors for applying a corrective voltage to said first array of capacitors; and

(d) a memory circuit for controlling said second array of capacitors.

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**4,611,196**

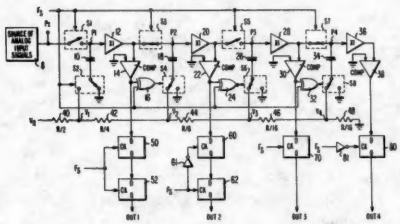
**PIPELINED SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTER**

**Antonio Fernandez, Brooklyn, N.Y., assignor to RCA Corporation, Princeton, N.J.**

**Filed Apr. 8, 1985, Ser. No. 720,946**

**Int. Cl.[4] H03M *00/00***

**U.S. Cl. 340—347 AD** **7 Claims**



1. An analog-to-digital converter comprising:

a terminal for applying an analog signal which may range between predetermined minimum and maximum values;

means for providing a sampling clock signal;

a first capacitor having first and second terminals;

first means responsive to said sampling clock signal for sequentially coupling the analog signal to the first terminal of said first capacitor to develop a first sequence of samples at the first terminal of said first capacitor, the samples of said first sequence having values which correspond to the instantaneous potential of said analog signal at times determined by said sampling clock signa;

first sqitching means for alternately coupling a source of first reference potential and a source of constant potential to the second terminal of said first capacitor to develop a second sequence of samples interleaved among the samples of said first sequence at the first terminal of said first capacitor, the values of the samples of said second sequence corresponding substantially to the difference between the corresponding samples of said first sequence and said first reference potential relative to said constant potential;

first comparison means coupled to the first terminal of said first capacitor and to said source of constant potential for developing a digital signal which is in a first state when a sample of said second sequence is greater than or equal to said constant potential and which is in a second state otherwise;

a second capacitor having first and second terminals;

second means responsive to said sampling clock signal for sequentially coupling the first terminal of said first capacitor to the first terminal of said second capacitor to develop a third sequence of samples at the first terminal of said second capacitor, the samples of said third sequence having values which are substantially equal to the samples of said second sequence;

second switching means responsive to a control signal for selectively coupling a source of second reference potential and said source of constant potential to the second terminal of said second capacitor to develop a fourth sequence of samples interleaved among the samples of said third sequence at the first terminal of said second capacitor, the samples of said fourth sequence corresponding substantially to the difference between the corresponding samples of said third sequence and said second reference potential relative to said constant potential;

means responsive to said sampling clock signal and to the digital signal provided by said first comparison means for developing the control signal for said second switching means;

second comparison means coupled to the first terminal of said second capacitor and to said source of constant potential for developing a digital signal which is in a first state when a sample of said fourth sequence is greater than or equal to said constant potential and which is in a second state otherwise.

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**4,611,197**

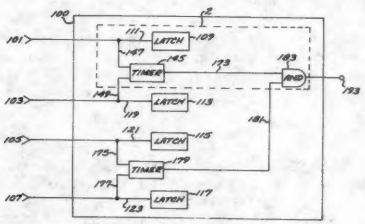
**MALFUNCTION-DETECTING STATUS MONITORING SYSTEM**

**Michael J. Sansky, 504 Via Juarez, San Clemente, Calif. 92672**

**Filed Feb. 19, 1985, Ser. No. 703,092**

**Int. Cl.[4] G08B *19/00***

**U.S. Cl. 340—522** **23 Claims**




1. A status monitoring system comprising:

a plurality of status sensors, each operative to provide a primary signal in response to a stimulus;

storage means associated with each of said sensors, each of said storage means being responsive to a primary signal from the associated one of said sensors to store a record of the occurrence of a primary signal from said associated sensor;

indicator means connected to said storage means, operative to provide an indication of the storage of a record of the occurrence of a primary signal;

a plurality of timers, each of said timers being connected to at least one of said sensors, each of said timers being responsive to a primary signal from any one of the sensors connected thereto to provide a timing output signal having a predetermined duration; and

logic means responsive to said timers to generate a status change signal when a plurality of said timing output signals are being provided simultaneously.

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**4,611,198**

**SECURITY AND COMMUNICATION SYSTEM**

**Samuel H. Levinson, 182 Maple Hill Rd., Glencoe, Ill. 60022, and Jack R. Caldicott, 28461 W. Kelsey Ct., Barrington, Ill. 60010**

**Filed Sep. 19, 1985, Ser. No. 777,770**

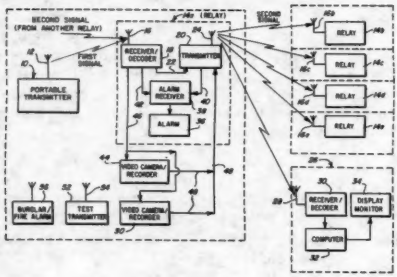
**Int. Cl.[4] G08B *1/08***

**U.S. Cl. 340—539** **19 Claims**

1. A security and communication system, which comprises:

at least one portable radio frequency transmitter having means for sending a first signal including a first individual identification code to identify the portable transmitter, when actuated by the user;

a plurality of radio frequency relays, each positioned in a predetermined location and having means for receiving said first signal and immediately transmitting a second signal including said first identification code and a second identification code to identify the individual relay that is transmitting the second signal;




each of said relays having alarm means for actuation in response to receipt of said second signal from another relay; each of said relays also having means for inhibiting its alarm in response to receipt of said first signal, whereby the relay directly receiving said first signal has its alarm inhibited while the alarm means of the other relays are not inhibited.

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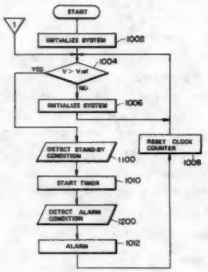
**4,611,199**

## ALARM SYSTEM AND METHOD FOR SENSING A STAND-BY STATE IN A DRIVER DROWSINESS DETECTION SYSTEM

**Yasutoshi Seko, Yokohama; Haruhiko Iizuka; Takayuki Yanagishima, both of Yokosuka, and Hideo Obara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Yokohama, Japan**

**Filed Feb. 15, 1984, Ser. No. 580,177**
**Claims priority, application Japan, Feb. 18, 1983, 58-24849**
**Int. Cl.[4] G08B *23/00***
**U.S. Cl. 340—576** **24 Claims**




1. An alarm system for a drowsy vehicle driver comprising:

a first detector for measuring a first period of time in which vehicle steering is substantially absent, said first detector being responsive to a first period of time longer than a first threshold to produce a first detector signal;

a second detector for detecting a steering adjustment in a single direction, said second detector being responsive to steering adjustments through an angle exceeding a second threshold in the presence of said first detector signal to switch the alarm system to a stand-by state;

a third detector for detecting a preselected steering operational condition while the system is in said stand-by state, and producing an alarm signal in response thereto; and

an alarm means responsive to said alarm signal to produce an alarm to keep the driver awake.

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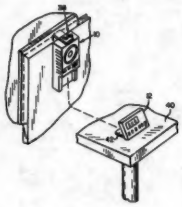
**4,611,200**

## PORTABLE BATTERY POWERED SMOKE DETECTOR AND CLOCK

**Fred W. Stilwell, H C 62, Box 50, Merrill, Oreg. 97633**

**Continuation of Ser. No. 363,983, Apr. 5, 1982, abandoned. This application Oct. 24, 1984, Ser. No. 664,097**
**Int. Cl.[4] G08B *17/10*; G04B *47/06***
**U.S. Cl. 340—628** **4 Claims**



1. A portable battery powered smoke detector and clock for a room comprising:

a case;

an electronic smoke detector within said case, said smoke detector including horn means for sounding an alarm upon the detection of products of combustion;

an alarm clock housing;

alarm clock means positioned within the housing;

means for detachably connecting said alarm clock means within said housing to said case such that said housing and case may be interconnected to form a compact portable unit and separated so as to permit positioning of said alarm clock means at one location within a room and said smoke detector at another location within a room;

said case including mounting means for releasably mounting the case, and thereby the smoke detector, to the upper edge of a room door to position the smoke detector at an upper elevation within the room;

said mounting means including an angular door gripping member with a horizontal arm portion having an elongate slot therein and a leg portion projecting downwardly from one end of the arm portion, and means for slidably engaging the slot for connecting the horizontal arm portion to the case such that said angled door gripping member is slidable from a compact first position in which the leg portion abuts a side surface of the case and the arm portion abuts the upper surface of the case to a second door engaging position in which the arm portion overlaps the upper edge of a room door and the leg portion is positioned at the opposite side of the door from the portion of the case containing the smoke detector; and

said mounting means further comprising a locking member positioned to overlie said horizontal arm portion with an opening through the locking member aligned with a portion of said slot in said horizontal arm portion, said means for connecting the horizontal arm portion comprising a pin passing through the central opening and slot and rigidly fastened to the upper surface of the case, the free end of said pin including an enlarged head for retaining the locking member and horizontal arm portion between the head of the pin and the upper surface of the case, the undersurface of the head of the pin including a cam and the upper surface of the locking element comprising a camming surface, whereby pivoting the locking element

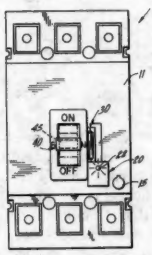
about the axis of the pin in one direction locks the horizontal arm portion against rotation about the axis of the pin and thereby locks the angled door gripping member in position, and whereby pivoting the locking element in the other direction releases the horizontal arm portion so that the angled door grippping member is free to move between the first and second positions.

## 4,611,201
## MAGNETICALLY ACTUATED ILLUMINATING WARNING DEVICE FOR CIRCUIT BREAKERS

**Raul Guim, and Aurelio R. Guim, both of Dade County, Fla. Continuation-in-part of Ser. No. 678,398, Dec. 5, 1984. This application Aug. 16, 1985, Ser. No. 766,266**

**Int. Cl.[4] G08B *21/00***

**U.S. Cl. 340—638** **5 Claims**




1. In a circuit breaker of the type that includes a switch assembly having a switch lever with three positions, on, off and overload, the improvement comprising:

A. illuminating warning means, including battery means for powering itself.

B. magnetic switch means in series and normally interrupting the operation of said warning means and said magnetic switch means positioned in the vicinity of said switch lever, and

C. permanent magnet means rigidly mounted on said lever and positioned to effectively activate said magnetic switch means when said switch lever is in the overload position.

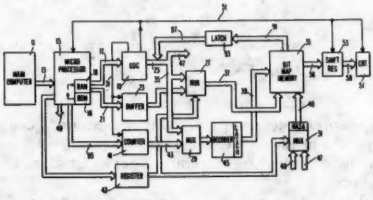
## 4,611,202
## SPLIT SCREEN SMOOTH SCROLLING ARRANGEMENT

**Robert S. DiNitto, Chelsea; Thomas C. Porcher, Stow, and John W. Eng, Southborough, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Oct. 18, 1983, Ser. No. 543,108**

**Int. Cl.[4] G09G *1/06***

**U.S. Cl. 340—724** **11 Claims**




1. In a cathode ray tube display arrangement which is used to display information from a main computer means, and which employs a bit map memory means to store pixel information to be displayed a circuit for effecting a split screen smooth scrolling operation comprising in combination: microprocessor means coupled to said main computer means to receive instruction data, and address data therefrom as well as coded text signals, said microprocessor means including means to encode said coded text signals into arrays of bit signals defining text characters which represent said coded text; controller circuitry means connected to said microprocessor means and having logic circuitry and having at least an address register with an address value therein and a region length register with a region length value therein, said controller circuitry mean having means to store instruction signals and address signals received from said microprocessor and further having means to increment an address value in said address register by one in correspondence to each scan line of said cathode ray tube and further having means to decrement a region length value in said region length register by one in correspondence to each scan line of said cathode ray tube; first circuitry means connected to said microprocessor means to receive said array of bit signals therefrom and connected to said bit map memory means to transmit said array of bits signals thereto; second circuitry means connected to said controller circuitry means to receive address signals therefrom and connected to said bit map memory to transmit address signals thereto, whereby said controller circuitry means acts, to perform an addressing procedure by transmitting first starting address signals and succeeding address signals to said bit map memory means to casue pixel elements in a particular region of said bit map memory means to be read in a read-out procedure, scan line after scan line, until the region length value in said region length register is decremented to zero and whereby thereafter said addressing and read out procedure set out above is repeated with each succeeding starting address differing from the preceding starting address by one scan line so that the display corresponding to the section of the bit map memory which was first addressed fades away one scan line at a time.

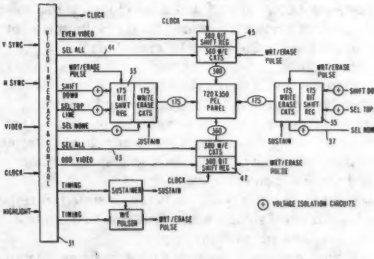
## 4,611,203
## VIDEO MODE PLASMA DISPLAY

**Tony N. Criscimagna, Woodstock; Harry S. Hoffman, Jr., Saugerties, and William R. Knecht, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 19, 1984, Ser. No. 591,099**

**Int. Cl.[4] G09G *3/28***

**U.S. Cl. 340—773** **4 Claims**




1. In a plasma display system adapted for character generation and display in video mode, the combination comprising;

a plasma display video monitor having a plurality of display cells arranged in a matrix configuration;

a data stream of video signals for display; and

means for generating a visual representation of said data stream during a raster scanning operation, said means including;

means for applying drive signals to first and second scan lines wherein all cells in said lines are selected;

means for selectively erasing said first scan line in accordance with the contents of said data stream to be displayed;

said second scan line providing uniform priming for the selective erasure of the cells in said first scan line;

said priming permitting said selected erasure to be performed on said first scan line with short duration erase pulses; and

means for synchronizing the movement of said second scan line with said raster scanning operation during said character generation whereby a line of priming cells is always maintained in the same relative position with respect to the scan line being selectively erased.

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**4,611,204**

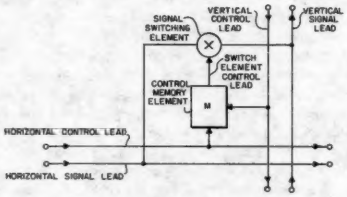
**ARRANGEMENT FOR AN ELECTROMECHANICAL SPACE SWITCHING NETWORK**

**Johannes Draayer, Scottsdale, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.**

**Filed Nov. 5, 1984, Ser. No. 668,341**

**Int. Cl.⁴ H04Q** *1/00*

**U.S. Cl. 340—825.8** **12 Claims**




1. In a switching network, an arrangement for an electromechanical space switching network for high voltage functions comprising:

means for generating a plurality of control signals;

a plurality of switching matrices sequentially connected, said plurality of switching matrices operated to establish a plurality of physical switching paths through said switching matrices from one particular inlet to one particular outlet;

each said switching matrix including:

a plurality of horizontal switching means including a horizontal control lead and a horizontal signal lead;

a plurality of vertical switching means including a vertical control lead and a vertical signal lead;

electromechanical switching means connected between a horizontal and a vertical switching means via said respective horizontal and vertical signal leads;

solid state control means connected to said means for generating by connection between a horizontal and a vertical switching means via said respective horizontal and vertical control leads;

said solid state control means being operated in response to said control signals transmitted via said control leads to produce a path closure signal;

said electromechanical switching means being operated in response to said path closure signal to establish a particular physical switching path via said corresponding horizontal and vertical signal leads; and

said vertical control lead of said one switching matrix being said horizontal control lead of said next sequential switching matrix for each of said switching matrices of said switching network;

said electromechanical space switching network further comprising:

each said switching matrix being simultaneously operated in response to said plurality of control signals to establish said particular physical switching path via said signal leads from said inlet of said first switching matrix, through each matrix to said outlet of said last switching matrix.

**4,611,205**

**DATA COLLECTION SYSTEM**

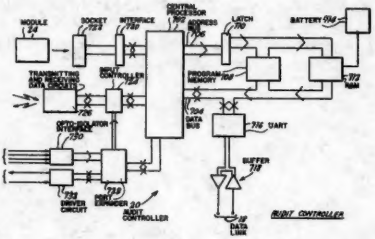
**David Eglise, Windsor, England, assignor to Mars, Inc., McLean, Va.**

**Filed Oct. 14, 1983, Ser. No. 542,144**

**Claims priority, application United Kingdom, Oct. 18, 1982, 8229654**

**Int. Cl.⁴ H04Q** *9/00*; **G06K** *5/02*; **G06F** *7/00*

**U.S. Cl. 340—825.35** **30 Claims**




1. A data collection system for a machine which generates data relating to its operation, the system comprising data collection means having a removable data storage module into which the collection means is operable to load said operation data, characterised in that the collection means is further operable to check that the data has been correctly loaded into the module, and, if so, to store in the module a predetermined indication code, which after removal of the module from the collection means can be recognised and thereby used as an indication that a successful operation data transfer has taken place.

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**4,611,206**

**APPARATUS FOR DETECTING QUANTITIES OF ROTARY MEMBER**

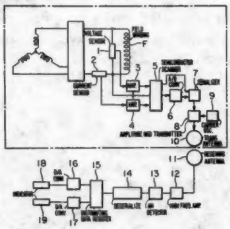
**Ryosuke Taniguti, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 15, 1982, Ser. No. 418,268**

**Claims priority, application Japan, Sep. 25, 1981, 56-152788**

**Int. Cl.⁴ G08C** *19/04*

**U.S. Cl. 340—870.11** **2 Claims**



2. Apparatus for detecting a plurality of measured quantities of a rotor of a brushless AC generator comprising:

a plurality of sensors for respectively sensing said measured quantities,

an analog amplifier in series with each sensor and providing a plurality of circuits carrying analog data signals representing measured quantities, said plurality of circuits being connected in parallel,

a single transmitting system connected in series with the parallel circuits including a scanner for scanning said parallel circuits for analog data signals, said scanner providing means for associating each of said analog data

signals with a digital channel identification signal generated by said scanner, an analog to digital convertor for converting said analog data signals into digital data signals, a data serializer, an amplitude modulation transmitter and an antenna for transmitting modulated signals representing said measured quantities and channel identification signals, said parallel circuits and single transmitting system being carried by said rotor, and

a stationary receiving system including, connected in series: a receiving antenna for said modulated signals, an amplitude modulation receivers and a data serializer, and a distributing data latch for receiving and separating said modulated signals according to the channel identification signals, and without regard to the sequence within said modulated signals, into parallel digital signals representing, respectively, different ones of said plurality of measured quantities, and

parallel indicator circuits connected to said data latch for receiving said parallel digital signals, each of said indicator circuits having a digital to analog convertor and an indicator in series with each convertor for receiving and converting said digital signals into analog indications of said plurality of measured quantities.

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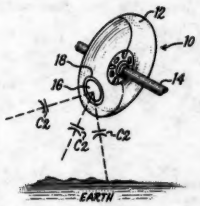
**4,611,207**

## APPARATUS FOR MONITORING VOLTAGE ON A HIGH VOLTAGE OVERHEAD TRANSMISSION LINE

**John G. Anderson, Schenectady, N.Y., and Howard R. Stillwell, Pittsfield, Mass., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.**

**Filed Oct. 31, 1983, Ser. No. 547,591**
**Int. Cl.[4] G08B *21/00*; G01R *31/02***
**U.S. Cl. 340—870.16** **2 Claims**




1. Apparatus for monitoring voltage on a high voltage aerial transmission line comprising, in combination:

A. an electrically conductive housing removably mounted on a high voltage aerial transmission line;

B. means electrically connecting said housing to the transmission line whereby said housing said housing assumes the electrical potential of the transmission line;

C. a dielectric sheet adhered to the exterior surface of said housing;

D. a metallic plate adhered in overlying relation to the exposed surface of said sheet, whereby said housing and said plate constitute the electrodes of a first capacitor and the capacitive coupling of said plate with the surrounding environment constitutes a second capacitor connected with said first capacitor as a capacitive voltage divider;

E. circuitry situated within said housing responsive to the voltage appearing on said plate for developing an ouput signal indicative of the transmission line voltage; and

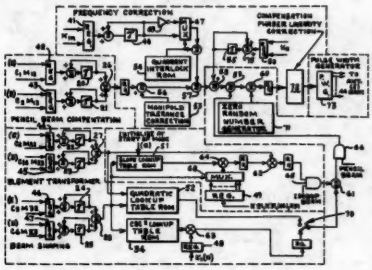
F. a lead connected with said plate and admitted through an opening in said housing for connection with said circuitry situated within said housing.

**4,611,208**

## MEANS FOR ALIGNING ELEVATION BEAM PATTERN ALONG AN ISODOP IN SYNTHETIC APERTURE MAPPING RADAR

**Jerry A. Kane, Crofton, Md., and Winthrop W. Smith, Jr., Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Oct. 4, 1983, Ser. No. 538,872**
**Int. Cl.[4] G01S *13/90***
**U.S. Cl. 343—5 CM** **5 Claims**



1. In a synthetic aperture mapping radar having an electronically scanned phased array antenna comprised of multiple antenna elements in rows and columns and a computer adapted to develop beam direction cosine data, beam space stabilization parameter data, elevation beam pattern data and azimuth scan scaling factor data, the improvement residing in a beam steering controller, said beam steering controller receiving direction cosine data, beam space stabilization data and elevation beam pattern data from said computer and developing therefrom azimuth direction cosine adjustment signals for each element row of said phased array antenna, said azimuth direction cosine adjustment signals having values that effect alignment of the antenna elevation beam pattern with a preselected isodop, said beam steering controller comprising:

means for developing a linear phase function over said phased array,

means for developing an isodop alignment phase function over said phased array, and

subtracting means, said subtracting means subtracting said isodop alignment phase function from said linear phase function and outputting direction cosine adjustment signals.

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**4,611,209**

## NAVIGATION WARNING SYSTEM AND METHOD

**Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540, and Christian Grund, 2035 Burr Ave., Bronx, N.Y. 10461**

**Filed Oct. 12, 1979, Ser. No. 84,426**
**Int. Cl.[4] G01S *13/93***
**U.S. Cl. 343—6.5 R** **20 Claims**

1. A navigational warning system comprising in combination:

an earth satellite positioned in orbit above the earth,

first means located with said satellite for scanning and receiving information indicative of the locations of vessels traveling a body of water on which navigation is conducted,

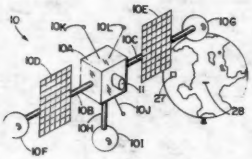
second means connected to said first means for generating output information signals which are indicative of locations of a pluraluty of vessels traveling said body of water,

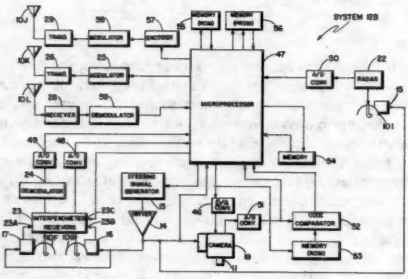
third means for processing said output information signals,

fourth means including an electronic computer for performing data processing operations with respect to signals generated by said third means,

a memory associated with said computer containing recordings of information defining the locations of certain fixed navigational hazards, such as shoals, reefs, wrecks and other hazards existing within said body of water,

said computer being operable to compare the locations of vessels detected by said first means with the locations of said navigational hazards defined by the information recorded in said memory and including means operable to generate output signals indicative of the navigation hazards which exist in the paths of vessels traveling said body of water,





fifth means for short wave transmitting said output signals to earth, and

short wave receiving means located on vessels traveling said body of water for receiving short wave signals transmitted by said short wave transmitting means of said earth satellite, and

warning means connected to said shortwave receiving means of said vessels receiving said shortwave signals which are indicative of specific hazards, for providing a warning indication of hazardous conditions along the route of each of said vessels.

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## 4,611,210
## TURNAROUND CONTROL FOR MECHANICALLY SCANNED RADAR ANTENNAS

**R. James Bennett, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jun. 20, 1984, Ser. No. 622,614**
**Int. Cl.[4] H01Q *3/02***
**U.S. Cl. 343—359** **2 Claims**

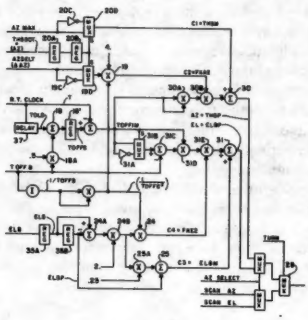
1. A programmed generator for a mechanically scanned antenna, to provide an n-bar scan pattern (n being a positive integer equal to one or greater), including a turnaround generator for controlling the antenna movement between bars, with predetermined inputs to the generator comprising a desired turnaround time, a maximum excursion of the antenna in azimuth, a start position for each bar, and on onbar scan rate;

wherein the turnaround generator comprises means to implement closed form equations which control both the position and the rate with constant acceleration, so that error signals indicate the actual movement of the antenna and its true error in the current commanded position;

wherein said closed form equations are

$$AZ_t = C_1 - C_2 \cdot (t')^2$$

$$EL_t = C_3 + C_4 \cdot t' \cdot (|t'| - C_5)$$



where t' is a function of a real time clock, $C_1$ is the azimuth position at the middle of the turnaround, $C_2$ is a multiplier for azimuth, $C_3$ is the elevation position at the middle of the turnaround, $C_4$ is an elevation multiplier, and $C_5$ is the desired time of offbar or turnaround time.

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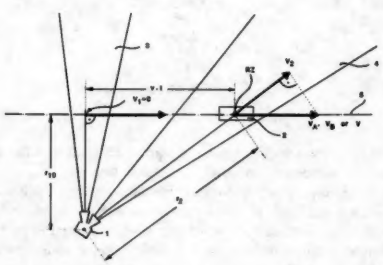
## 4,611,211
## RADAR DEVICE

**Franz Leitl, Alleenstrasse 21, D-7015 Korntal-Münchingen, and Georg Schulte-Hubbert, Schützenplatz 4, D-7141 Möglingen, both of Fed. Rep. of Germany**

**Filed Mar. 29, 1982, Ser. No. 362,985**
**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3113904**
**Int. Cl.[4] G01S *13/58***
**U.S. Cl. 343—9 R** **12 Claims**



1. A method for determining the velocity of an object by an FM-CW radar device, said method comprising the steps of:

(a) transmitting first modulated signals of a central frequency $f_{01}$ in a first direction of a first radiation pattern, and transmitting second modulated signals of a central frequency $f_{02}$ in a second direction of a second radiation pattern,;

(b) receiving third modulated signals of a central frequency $f_3$ reflected in the first direction by an object of radial velocity $V_1$ having the distance $r_1$ from the receiver and receiving forth modulated signals of a central frequency $f_4$ reflected in the second direction by an object of radial velocity $V_2$ having the distance $r_2$ from the receiver, said

first and second radiation patterns including an angle less than 90°;

(c) calculating $r_1$, $V_1$, $r_2$ and $V_2$ from a first beat frequency $f_{b1}=f_{01}-f_3$ and a second beat frequency $f_{b2}=f_{02}-f_4$;

(d) storing the values of $r_1$, $V_2$, $r_2$, and $V_2$; and

(e) calculating the velocity in movement direction of the object by the equation

$$V_B=\sqrt{\frac{(V_2r_2)^2-(V_1r_1)^2}{r_2^2-r_1^2}}$$

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**4,611,212**

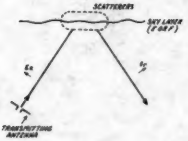
## FIELD COMPONENT DIVERSITY ANTENNA AND RECEIVER ARRANGEMENT

**William C. Lee, Denville, N.J., assignor to ITT Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 301,926, Sep. 14, 1981, abandoned. This application May 1, 1984, Ser. No. 605,969**

**Int. Cl.⁴ G01S** *3/02;* **H01Q** *21/00;* **H04B** *1/06*

**U.S. Cl. 343—351** **39 Claims**




1. A field component diversity antenna arrangement to receive uncorrelated electric field and magnetic field components of a transmitted signal in a multipath fading environment comprising

at least a first pair of parallel spaced straight, vertical elemental antenna elements disposed substantially parallel to said electric field component to receive said transmitted signal;

a first straight conductor connecting said first pair of antenna elements together to enhance said magnetic field component;

a first 180° my hybrid ciruit coupled to said first pair of spaced antenna elements to provide a first output signal proportional to said electric field component and a second ouput signal proportional to said magnetic field component; and

a diversity combiner coupled to said hybrid circuit for combining said first and second output signals, wherein said first straight conductor is adapted so as to have its position along said first pair of antenna elements adjustable in order to obtain equal amplitude voltages in response to said received electronic field and magnetic field components.

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**4,611,213**

## COAXIAL CONNECTOR FOR ANTENNA

**Erlon F. Johnson, Elizabethtown, and Craig D. Richards, Boiling Springs, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Jun. 8, 1984, Ser. No. 619,089**

**Int. Cl.⁴ H01Q** *1/24*

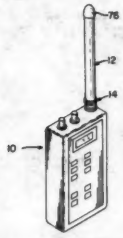
**U.S. Cl. 343—702** **19 Claims**

1. A coaxial connector for connection to one end of an antenna, comprising:

a metal shell including a coupling section for coupling the connector to a complementary coaxial connector;

a dielectric member disposed in the metal shell and having a front section and a rear section and a bore extending therethrough, said bore having a forward section of polygonal configuration and a rearward section;

means on said dielectric member and said metal shell securing said dielectric member in said metal shell for rotation relative to one another; and




a center contact member having a forward contact section, a threaded section and a rear contact section on which an end of an antenna is secured, said center contact member being secured into said rear section of said dielectric member by screwing said threaded section into said rear section of said bore while said polygonal front section is held stationary on a complementary polygonal section of a holding member so that said forward contact section extends coaxially along said front section of said bore.

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**4,611,214**

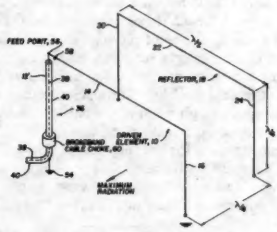
## TACTICAL HIGH FREQUENCY ARRAY ANTENNAS

**Donn V. Campbell; Palemon W. Dubowicz, and Felix Schwering, all of Eatontown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jun. 27, 1984, Ser. No. 624,896**

**Int. Cl.⁴ H01Q** *9/32, 5/01*

**U.S. Cl. 343—790** **13 Claims**




1. A vertically polarized broadside antenna array comprising:

a mutually square multi-segment antenna including a driven element located at a predetermined distance above the surface of the earth and point of ground reference potential,

said driven element having at least one generally horizontal half wavelength segment and at least two vertical quarter wavelength segments located at and electrically connected to the respective ends of said half wavelength segment;

a top feedpoint located at the connection of the upper end of one of said vertical quarter wavelength segments with one end of said half wavelength segment; and

signal feed means feeding radio frequency signals to said top feedpoint including signal isolation means for isolating said signal from said ground reference.

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**4,611,215**

## PEN-RECORDING APPARATUS WITH MULTI-STATION PEN-HOLDING HEAD

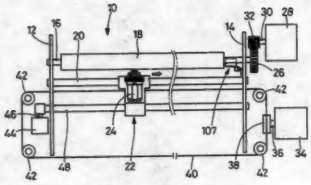
**Hiroshi Onoda, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Aug. 13, 1984, Ser. No. 640,469**

**Claims priority, application Japan, Aug. 20, 1983, 58-151977**

**Int. Cl.[4] G01D** *9/28, 15/16*

**U.S. Cl. 346—49** **17 Claims**



1. A pen-recording apparatus for writing on a sheet of recording medium, having a rotatable platen for holding the sheet, and at least one pen movable relative to the platen for writing on the sheet, said pen-recording apparatus comprising:

a carriage, movable along an axis of said platen;

a pen-holding head supported by said carriage and rotatable about an axis thereof substantially perpendicular to a line of movement of said carriage, said pen-holding head holding a plurality of pens such that axes of said pens are equiangularly spaced from each other circumferentially of a circle having a center at said axis of the pen-holding head, said pens being axially movable toward and away from said platen;

drive means for moving said carriage along said line of movement of the carriage;

a pinion rotatably supported by and movable with said carriage, and coupled to said pen-holding head to transmit a rotary motion thereof to the pen-holding head;

a rack member including a rack disposed parallel to said line of movement of the carriage, said rack being engageable with said pinion and rotating the pinion when said carriage is moved by said drive means in one of opposite directions along said line of movement thereof, said rack having a sufficient length so that a rotary motion of said pinion caused by each movement of said carriage relative to said rack in said one direction causes said pen-holding head to rotate through an angle equal to an angle of circumferential spacing of said pens; and

anti-engagement means for holding said pinion and said rack out of engagement with each other to prevent said pinion from being rotated by said rack when said carriage is moved by said drive means in the other direction.

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**4,611,216**

## CHARGED INK PARTICLES DETECTION HOUSING

**Chuji Ishikawa, Kawasaki, and Shigeyuki Araki, Komae, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Feb. 8, 1985, Ser. No. 700,024**

**Claims priority, application Japan, Feb. 22, 1984, 59-32054; Feb. 22, 1984, 59-32053; Feb. 22, 1984, 59-32057; Feb. 22, 1984, 59-32056; Feb. 22, 1984, 59-32055**

**Int. Cl.[4] G01D** *15/18*

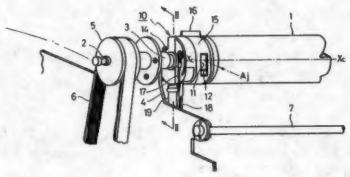
**U.S. Cl. 346—75** **10 Claims**

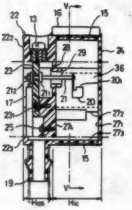
1. An apparatus for detecting deflection of charged ink particles comprising:

a detector unit for detecting charged ink particles, the unit including a substantially cylindrical housing having a front surface and an opening formed in its front surface for receiving flying ink particles, an electrode disposed internally of said housing for detecting charged ink particles, a spring abutment located at the rear side of said housing and means defining a central sleeve extending across said opening and a central bore extending through said central sleeve;

a stationary sleeve member extending through said bore and a bore in said stationary sleeve member for permitting a platen shaft member to extend therethrough;

spring means for urging the detector unit for rotation in one direction about the axis of the central bore;





an adjusting screw member disposed for engagement with the spring abutment and a stationary member for preventing a rotation of the detector unit under the resilience of the spring means beyond a set position;

a threaded hole extending from the surface of the housing to the central bore; and

a locking screw member threadably engaging the threaded hole and adapted to be tightened against the sleeve member.

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**4,611,217**

## THERMAL TRANSFER COLOR GRADATION PRINTING APPARATUS

**Jiro Iizuka, Tokyo; Takatoshi Kaneko, Machida, and Tooru Hashiba, Tokyo, all of Japan, assignors to Victor Company of Japan Ltd., Japan**

**Filed Dec. 18, 1984, Ser. No. 683,030**

**Claims priority, application Japan, Dec. 20, 1983, 58-240543**

**Int. Cl.[4] G01D** *15/10;* **B41J** *3/20;* **H04N** *1/46*

**U.S. Cl. 346—76 PH** **7 Claims**

1. A thermal transfer type printing apparatus comprising:

input terminal means for receiving color signals related to a color picture or the like which is to be printed with a desired gradation;

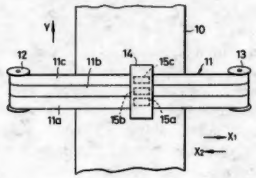
converting means for converting the color signals from said input terminal means into n-bit digital data, where n is a natural number greater than or equal to one;

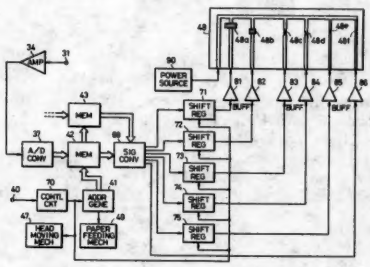
a paper feeding mechanism responsive to a first signal for feeding in a first direction in terms of an integral multiple of one printing line a printing paper on which the color picture or the like is to be printed;

an ink ribbon traversing over said printing paper, said ink ribbon being divided into at least three colors in a width direction thereof and having a first through third ink parts extending in a longitudinal direction of said ink ribbon,

said first through third ink parts being respectively coated with ink of first through third colors;

a thermal printing head arranged at such a location that said ink ribbon is interposed between said thermal printing head and said printing paper, said thermal printing head comprising first through third heating element groups respectively opposing said first through third ink parts of said ink ribbon, each of said first through third heating element groups comprising first through n-th heating elements which are selectively heated responsive to an n-bit digital datum from said converting means, a k-th heating element among said first through n-th heating elements having an area $M/2^i$ when a total area of one picture element is respresented by M, where each of k and i is a natural number which is selected from among one through n so that respective areas of said first through n-th heating elements are different from each other, said first through n-th heating elements being arranged substantially along a printing line at such positions that the areas of said first through n-th heating elements correspond to different picture element parts of one picture element in




the printing line which is to be printed, said different picture element parts of said one picture element not overlapping with each other, said printing line extending in a second direction which is perpendicular to said first direction, said first through n-th heating elements performing a printing operation with respect to one picture element with one gradation out of $2^n$ possible gradations by melting the ink coated on a corresponding ink part among said first through third ink parts when selectively heated and transferring the melted ink onto said printing paper, said first through third heating element groups simultaneously printing a plurality of printing lines by use of the ink of first through third colors;

a head moving mechanism responsive to a second signal for shifting said thermal printing head in said second direction in terms of one picture element; and

control means for supplying said second signal to said head moving mechanism every time at least one heating element out of said first through n-th heating elements in each of said first through third heating element groups completes a printing operation with respect to one picture element in one of said plurality of printing lines, and for supplying said first signal to said paper feeding mechanism every time said thermal printing head is successively shifted in said second direction from a printing start position on one printing line and reaches a printing end position on the same one printing line.

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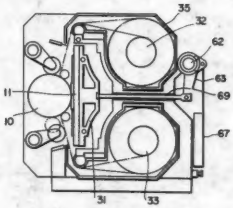
## 4,611,218
## THERMAL HEAD POSITIONING APPARATUS WITH RIBBON CASSETTE

**Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan**

**Filed Dec. 26, 1984, Ser. No. 686,386**
**Claims priority, application Japan, Dec. 27, 1983, 58-246349**
**Int. Cl.[4] G01D** *15/10*
**U.S. Cl. 346—76 PH** **7 Claims**




**1.** An image building apparatus comprising:

a frame member;

a platen positioned adjacent said frame member;

a recording head mounted on said frame member adjacent said platen and movable relative to said platen between a first position in contact with said platen and a second position out of contact with said platen;

a cassette, detachably mounted on said frame member, including a pair of closely adjacent winding cores and a supply of ribbon-shaped image transference material wound on said pair of winding cores, said image transference material passing between said platen and said recording head, said recording head being positioned between said platen and said winding cores;

driving power source means for moving said recording head between said first and second positions, said driving power source means being positioned opposite said recording head with respect to said cassette; and

driving power transmitting means, extending between said winding cores of said cassette, for transmitting driving power from said driving power source means to said recording head.

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## 4,611,219
## LIQUID-JETTING HEAD

**Hiroshi Sugitani, Machida; Hiroto Matsuda, Yokohama, and Masami Ikeda, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 20, 1982, Ser. No. 451,500**
**Claims priority, application Japan, Dec. 29, 1981, 56-215328; Dec. 29, 1981, 56-215329; Dec. 29, 1981, 56-215330**
**Int. Cl.[4] G01D** *15/18*
**U.S. Cl. 346—140 R** **16 Claims**

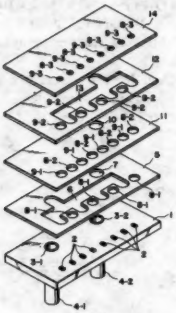
**1.** A recording head, for liquid jet recording apparatus, comprising a generally flat orifice plate with an array of orifices spaced apart in the plane of said orifice plate for the ejection of liquid and a base member on which said orifice plate is mounted; wherein:

said base member includes a plurality of chambers for receiving recording liquid supplied to the head, each said chamber being associated exclusively with a set of said orifices;

each said chamber has a number of separate branch paths

associated therewith for receiving recording liquid directly from said chamber and conveying it to said set of orifices associated therewith in a direction generally parallel to the plane of said orifice plate;

each said branch path includes a pressure-generating transducer arranged for applying pressure impulses to liquid in



said branch path to eject recording liquid from a corresponding orifice in a direction transverse to the direction of liquid conveyance thereto; and

a wall of at least one of said chambers and said branch paths associated therewith is provided by a surface of said orifice plate.

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**4,611,220**

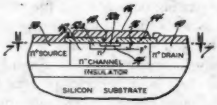
**JUNCTION-MOS POWER FIELD EFFECT TRANSISTOR**

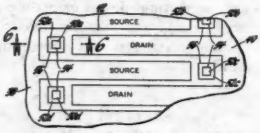
**Bernard A. MacIver, Lathrup Village, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 16, 1983, Ser. No. 552,409**

**Int. Cl.[4] H01L *29/80, 29/78, 27/12***

**U.S. Cl. 357—23.7** **7 Claims**




**1. In a depletion mode thin film insulated gate field effect transistor having a channel of given conductivity type and of a thickness of about 0.5–5 micrometers, a dielectric overlying the channel, and a gate electrode overlying the dielectric, the improvement wherein the channel includes at least one first island of opposite conductivity type on its surface, a second island of the same conductivity type as the channel nested wholly within the first island, and means for applying an electrical potential to the second island, whereby undesired minority current carriers can be bled from the channel surface when a preselected pinch-off potential is applied to the gate electrode effective to produce a stronger electrical field in the channel from the preselected pinch-off potential and enhanced channel conductivity is produced when an opposite polarity potential is applied to the gate electrode.**

**3. The thin film power transistor of claim 2 wherein the source region is the region including the silicon layer portion contacting the silicon substrate.**

**4,611,221**

**SOLID STATE IMAGE PICK-UP DEVICE**

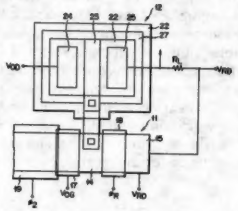
**Masaharu Imai, Nagano; Ikuo Tohukuji, Okaya; Osamu Onitsuka, Tokyo; Terumasa Morita, Tokyo; Shunpei Tanaka, Tokyo, and Hiroshi Matsui, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jun. 2, 1983, Ser. No. 500,303**

**Claims priority, application Japan, Jun. 17, 1982, 57-104319**

**Int. Cl.[4] H01L *27/14***

**U.S. Cl. 357—30** **5 Claims**



**1. A solid state image pick-up device comprising:**

**a charge storage and transfer means for storing a signal charge corresponding to an image pattern, and for transferring said stored signal charge so as to issue an output corresponding to said stored signal charge; and**

**reading out means for reading out the stored signal charge in said charge storage means as a picture signal, said reading out means including an output transistor comprising a junction type field effect transistor (J-FET) having a gate region connected to an output of said charge storage and transfer section.**

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**4,611,222**

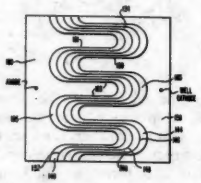
**SOLID-STATE SWITCH**

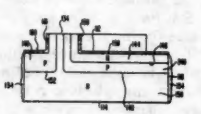
**Derrick J. Page, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 84,210, Oct. 12, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,564**

**Int. Cl.[4] H01L *27/14***

**U.S. Cl. 357—30** **6 Claims**





**1. A four-region solid-state switching device comprising, a body of semiconductor material, said body having top and bottom opposed major surfaces, anode and cathode emitter regions spaced apart and disposed in said top surface, anode base region and cathode base region exposed on a mesa portion of said top surface to receive activating light pulses, said mesa portion being disposed between said anode and cathode emit-**

ter region and metal electrodes affixed to only said anode emitter region and said cathode emitter region.

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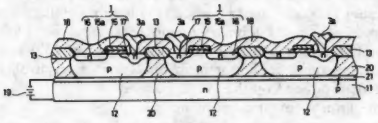
## 4,611,223
## SOLID-STATE IMAGE SENSOR AND MANUFACTURING PROCESS THEREOF

**Shiro Hine, Minoo, and Hidenobu Ishikura, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 25, 1983, Ser. No. 526,402**
**Claims priority, application Japan, Oct. 25, 1982, 57-188552**
**Int. Cl.[4] H01L *27/14, 29/78***
**U.S. Cl. 357—30** **20 Claims**



1. A solid-state image sensor comprising:
a semiconductor substrate,
an epitaxial growth semiconductor layer formed on one major surface of said semiconductor substrate,
a photoelectric transducing portion including a plurality of photoelectric transducers provided horizontally in a plurality of rows and vertically in a plurality of columns at distances from each other on a surface of said epitaxial growth semiconductor layer,
a horizontal scanning circuit portion provided in the surface of said epitaxial growth semiconductor layer at a distance from said photoelectric transducing portion, in parallel with said photoelectric transducers in a horizontal direction, said horizontal scanning circuit portion scanning successively said photoelectric transducers in said plurality of columns,
a vertical scanning circuit portion provided in the surface of said epitaxial growth semiconductor layer at a distance from said photoelectric transducing portion, in parallel with said photoelectric transducers in a vertical direction, said vertical scanning circuit portion scanning successively said photoelectric transducers in said plurality of rows,
a field insulating film formed in the surface of said epitaxial growth semiconductor layer for separating said photoelectric transducers of said photoelectric transducing portion, said horizontal scanning circuit portion and said vertical scanning circuit portion, and
a buried insulating film provided between said field insulating film and said semiconductor substrate.

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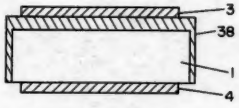
## 4,611,224
## SEMICONDUCTOR RADIATION DETECTOR

**Yasukazu Seki, Tokyo; Noritada Sato, and Masaya Yabe, both of Kanagawa, all of Japan, assignors to Fuji Electric Corporate Research & Development Co., Ltd., Yokosuka and Fuji Electric Company, Ltd., Kawasaki, both of, Japan**

**Filed Aug. 14, 1984, Ser. No. 640,659**
**Claims priority, application Japan, Aug. 26, 1983, 58-156031**
**Int. Cl.[4] H01L *27/14***
**U.S. Cl. 357—30** **3 Claims**



1. A semiconductor radiation detector comprising:
a semiconductor bulk region of a first conductivity type having a principal surface;
a first amorphous semiconductor layer of a second conductivity type formed on a first portion of the principal surface of the bulk region;
a second armorphous semiconductor layer formed on a second portion of the principal surface surrounding the first portion, the second amorphous layer being substantially undoped;
a first electrode in electrical contact with the bulk region; and
a second electrode in electrical contact with the first amorphous layer.

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## 4,611,225
## PROGRESSIVE SCAN HDTV SYSTEM

**Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.**

**Filed Feb. 14, 1985, Ser. No. 701,608**
**Int. Cl.[4] H04N *7/01***
**U.S. Cl. 358—140** **7 Claims**

| POINT | SAMPLE RATE MHZ | LINE RATE KHZ | FRAME RATE HZ | TOTAL HORIZ. SAMPLES | ACTIVE HORIZ. SAMPLES | LINES PER VERT. SCAN | ACTIVE LINES PER FRAME |
|---|---|---|---|---|---|---|---|
| 14 | 72 | 45 | 60 | 1600 | 1280 | 750 | 720 |
| A | 54 | 45 | 60 | 1200 | 960 | 750 | 720 |
| B | 40.5 | 45 | 60 | 900 | 720 | 750 | 720 |
| C | 27 | 30 | 60 | 900 | 720 | 500 | 484 |
| D | 13.5 | 15.734 | 29.97 (2-1) | 858 | 720 | 262.5 | 484 |
| E | 33.75 | 37.5 | 50 | 900 | 720 | 750 | 720 |
| F | 27 | 30 | 50 | 900 | 720 | 600 | 576 |
| G | 13.5 | 15.625 | 25 (2-1) | 864 | 720 | 312.5 | 576 |

1. A HDTV system, comprising:
imaging means having an output for providing a video output signal respresentative of a raster scanned image and input means for receiving vertical and horizontal scanning signals for controlling the field rate and the line rate, respectively, of said raster scanned image; and
timing signal generator means, coupled to said input means of said imaging means, for supplying a vertical timing signal thereto having a frequency of 60 Hz and for supplying a horizontal timing signal thereto having a frequency of 45,000 Hz for causing said video output signal to exhibit field and line rates of 60 Hz and 45,000 Hz, respectively, in non-interlaced form.

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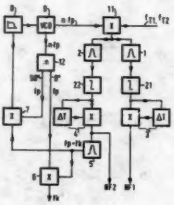
## 4,611,226
## TELEVISION RECEIVER INCORPORATING A PROCESSING SECTION FOR PROCESSING STEREO/MULTICHANNEL-SOUND SIGNALS

**Ulf H. Buhse, Kollmar, and Hans-Jürgen Kühn, Buchholz, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed May 25, 1984, Ser. No. 614,187**
**Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319237; May 27, 1983, 3319238**
**Int. Cl.[4] H04N *7/04***
**U.S. Cl. 358—144** **3 Claims**

1. A television receiver incorporating a processing section for processing television/stereo-dual sound signals, said sound signals having a first sound carrier ($f_{T1}$) which is modulated by a first sound signal (NF1), and a second sound carrier ($f_{T2}$) which is modulated both by a second sound signal (NF2) and also by a pilot signal (fp) which is, in turn, modulated by a stereo-dual sound identifying signal ($f_{K1}$, $f_{K2}$), said processing section comprising means for demodulating said first and said second sound carriers, respectively, forming said first sound signal, and said second sound signal along with said modulated pilot signal, a phase-locked loop having a frequency-controlled oscillator and a phase discriminator for controlling said frequency-controlled oscillator, said phase discriminator compar-

ing a signal derived from said frequency-controlled oscillator with a reference signal which, in regard to frequency and phase, is in a fixed relationship to the modulated pilot signal, and a synchronous demodulator, coupled to an output of said phase-locked loop, for demodulating said modulated pilot signal thereby recovering said stereo-dual sound identifying signal, characterized in that said processing section further comprises a mixer for receiving at least said modulated second sound carrier, to which is also applied an output signal of said



frequency-controlled oscillator, said mixer converting said modulated second sound carrier to a lower frequency range, said demodulating means being coupled to an output of said mixer and comprising at least a demodulator for said modulated second sound carrier forming at an output thereof said second sound signal and said modulated pilot signal, and a filter coupled to the output of said demodulatoar for selecting the modulated pilot signal therefrom, said modulated pilot signal then being applied to said phase discriminator in said phase-locked loop as said reference signal.

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**4,611,227**

**DECODER FOR DIGITAL INFORMATION T.V. SIGNAL**

**David M. Brockhurst, Winchester; Roy H. Vivian, Andover; Martyn R. Dyer, Romsey, and Stephen Day, Winchester, all of United Kingdom, assignors to Independent Broadcasting Authority, London, England**

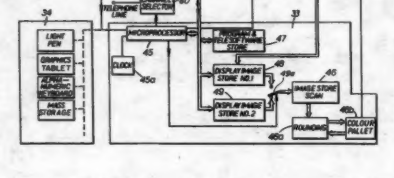
**PCT No. PCT/GB82/00089, § 371 Date Nov. 22, 1982, § 102(e) Date Nov. 22, 1982, PCT Pub. No. WO82/03290, PCT Pub. Date Sep. 30, 1982**

**PCT Filed Mar. 19, 1982, Ser. No. 448,986**

**Claims priority, application United Kingdom, Mar. 20, 1981, 8108822**

**Int. Cl.[4] H04N** *7/087, 7/08*

**U.S. Cl. 358—147** **10 Claims**



1. In a television system including input means (40) for receiving a demodulated television signal carrying, during picture-free periods thereof, a set of pages of information represented by serial binary signals provided in a repeated cycle and at least some of the binary signals representing coded instructions, the form of the cycle being such that the binary signals for the set of pages received are in groups, which groups are received each in a different one of said periods and the whole of the information for the set of pages is received during each occurrence of the cycle; a parallel binary memory device (41) connected with the input means (40) for storing binary signals representing a page of information; processing means (45) for controlling the system and connected with the input means and the parallel binary memory device; selector means (42) connected with the processing means for generating a desired page address code and activating the processing means to effect storage of the binary signals representing the page; further storage means (47) connected with the processing means and the parallel binary memory device (41) for storing a plurality of routines for use by the processing means; the processing means being arranged to access a received coded instruction in the parallel binary memory device and accessing the further storage means in order to carry out the required instruction; signal generator means (44) connected with the parallel binary memory device (41) for processing the signals stored in the parallel binary memory device to produce output signals for visual display; and display means (30) connected with the signal generator means (44) for visual display of the signals produced by the signal generator,

the improvement comprising:

(a) a timer means (45*a*) connected with said processing means (45) for enabling the same to control the timing of the processing of the incoming coded instructions;

(b) inhibiting means (44*a*) connected with said signal generator means (44) and said processing means (45) and operable by said processing means to prevent operation of the said signal generator; and

(c) auxiliary storage means (48) connected with said signal generator means (44), said parallel binary memory device (41), said further storage means (47) and the said processing means (45) for receiving signals representing a visual image from at least one of the processing means, signal generator means and the parallel binary memory device, said processing means (45) and timer means (45*a*) being arranged to effect and control the input of signals from said at least one of the processing means (45), signal generator means (44) and parallel binary memory device to the auxiliary storage means (48), said auxiliary storage means (48) having an output connected with said display means (30), thereby to display the contents of said auxiliary storage means.

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**4,611,228**

**SCAN LINE SYNCHRONIZER**

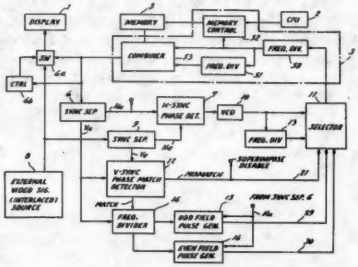
**Toyotaka Machida, Kashiwa; Shigeharu Ueguri, Ibaraki; Hiroaki Matsumoto, Mitsukaido; Akira Nakamura, and Tatsuya Shinyagaito, both of Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Sep. 20, 1984, Ser. No. 652,563**

**Claims priority, application Japan, Sep. 20, 1983, 58-173957**

**Int. Cl.[4] H04N** *5/04*

**U.S. Cl. 358—149** **12 Claims**



1. An apparatus for establishing synchronism between horizontal and vertical synchronization pulses of a first video

signal and horizontal and vertical synchronization pulses of a second video signal, the numbers of horizontal and vertical synchronization pulses of the first video signal being such that scan lines are produced in a non-interlaced format on first and second fields of a frame, and the numbers of horizontal and vertical synchronization pulses of the second video signal being such that scan lines are produced in an interlaced format on first and second fields of a frame, the number of the scan lines produced on each frame by said first video signal being smaller by $2n-1$ than the scan lines produced on each frame by said second video signal, where n is an integer equal to or greater than unity, comprising:

first means for dividing the frequency of clock pulses applied thereto and generating the horizontal and vertical synchronization pulses of said first video signal;

second means for detecting a phase difference between the horizontal synchronization pulses of said first and second video signals;

third means for generating a signal having a higher frequency variable as a function of the phase detected by the phase difference detecting means and a signal having a lower frequency variable as a function of said phase difference, the lower frequency being one half of said higher frequency;

fourth means for detecting a phase match and a phase mismatch between the vertical synchronization pulses of said first and second video signals;

fifth means responsive to said phase match for defining a first period running from a horizontal synchronization pulse of first occurrence in a given field of said first video signal to a horizontal synchronization pulse of $(n-1)$th occurrence in said given field and defining a second period running from a horizontal synchronization pulse of first occurrence in a subsequent field of said first video signal to a horizontal synchronization pulse of n-th occurrence in said subsequent field; and

sixth means for normally applying said higher frequency signal as said clock pulses to said first means and applying said lower frequency signal to said first means instead of said higher frequency signal both during said phase mismatch and during said defined first and second periods.

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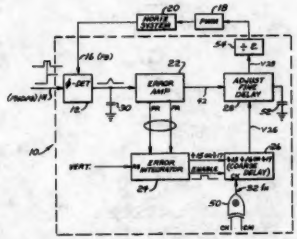
**4,611,229**

## AUTO RANGE HORIZONTAL AUTOMATIC PHASE CONTROL

**Gopal K. Srivastava, Buffalo Grove, and Ronald B. Lee, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Jun. 17, 1983, Ser. No. 505,518**
**Int. Cl.[4] H04N** *5/04*
**U.S. Cl. 358—158** **17 Claims**



**13**. A circuit for phase locking the flyback pulse of a television horizontal system to a reference signal comprising:

a detector coupled to determine phase differences between the flyback pulse and the reference signal, and arranged to provide an error signal indicating said phase differences;

a control circuit coupled to receive said error signal and to provide first and second control signals;

a first delay circuit coupled to respond to said first control signal;

a second delay circuit coupled to respond to said second control signal, said first delay circuit being coupled to receive signals from said second delay circuit at a phase determined by said second delay circuit, said first delay circuit being arranged to output a phase adjusted signal to the horizontal system thereby to control the timing of the flyback pulse.

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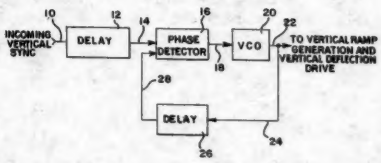
**4,611,230**

## VERTICAL VIDEO CENTERING CONTROL SYSTEM

**David K. Nienaber, Des Plaines, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Dec. 18, 1984, Ser. No. 683,125**
**Int. Cl.[4] H04N** *5/04, 7/00*
**U.S. Cl. 358—158** **8 Claims**




**1**. A vertical sync adjustment system for altering the phase of a vertical sync signal during a vertical field interval to accomplish vertical video centering on a display raster comprising:

first delay means for delaying a received vertical sync signal;

phase detector means for generating an output signal representational of the phase difference between said delayed vertical sync signal and a reference signal;

oscillator means coupled to said phase detector means and having a frequency which is controlled by said representational output signal to generate a phase modified vertical rate signal; and

second delay means for delaying said phase modified vertical rate signal to generate said reference signal to be supplied to said phase detector means.

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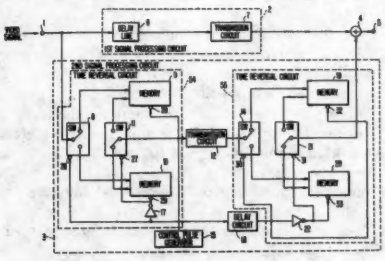
**4,611,231**

## SIGNAL PROCESSING APPARATUS FOR A VIDEO SIGNAL

**Masaaki Kobayashi, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed May 30, 1984, Ser. No. 615,243**
**Claims priority, application Japan, May 31, 1983, 58-97077; Jun. 24, 1983, 58-114505; Jun. 27, 1983, 58-116333**
**Int. Cl.[4] H04N** *5/14, 5/91, 5/21*
**U.S. Cl. 358—160** **19 Claims**



**1**. A signal processing apparatus comprising:

a video signal input terminal for feeding an input video signal;

a delay line for delaying said input video signal;

a first transmission circuit having a transfer function G for processing the video signal delayed by said delay line;

a first time reversal circuit for reversing the time sequence of said input video signal in a predetermined period;

a second transmission circuit having the transfer function G for processing the time reversed signal from said first time reversal circuit;

a second time reversal circuit for reversing the time sequence of the signal processed by said second transmission circuit in said predetermined period;

an adder circuit for adding the signal processed by said first transmission circuit and the time reversed signal from said second time reversed circuit; and

a control pulse generator for producing a control pulse sequence inverting its level with said predetermined period to control said first and second time reversal circuits.

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**4,611,232**

## VIDEO PROCESSING SYSTEM FOR PICTURE ROTATION

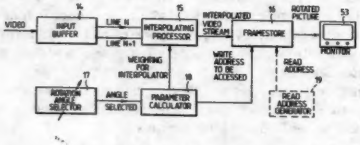
**Anthony D. Searby, Newbury, England, assignor to Quantle Limited, Newbury, England**

**Filed Mar. 15, 1983, Ser. No. 475,580**

**Claims priority, application United Kingdom, Mar. 19, 1982, 8208053**

**Int. Cl.⁴ H04N *5/14***

**U.S. Cl. 358—160** **27 Claims**




1. A picture rotation system for producing a rotated picture from an incoming picture comprising video lines of picture point information, comprising:

input means for receiving said video lines and for concurrently providing two adjacent video lines of picture point information;

means for selecting a degree of rotation of the incoming picture required to derive a desired rotated picture;

interpolating processing means responsive to selected picture point information provided by the input means for interpolating picture point information for the rotated picture;

means responsive to the selected degree of rotation for calculating (i) a fractional part applied to the interpolation processing means for determining relative proportions of the selected picture point information used by the interpolating processing means for interpolating picture point information for the rotated picture and (ii) an integer part identifying coordinates for picture point information in the rotated picture;

a framestore for storing said interpolated picture point information for the rotated picture; and

sequencing means responsive to said integer part for determining an accessing sequence of framestore locations to receive the interpolated picture point information for the rotated picture to effect rotation of said picture point information of the incoming picture.

**4,611,233**

## DIGITAL NON-ADDITION MIXING APPARATUS FOR VIDEO SIGNALS

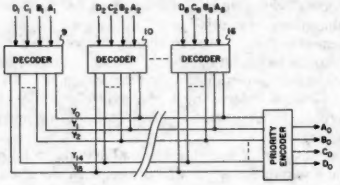
**Takao Tanno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Mar. 25, 1983, Ser. No. 497,899**

**Claims priority, application Japan, May 25, 1982, 57-88244**

**Int. Cl.⁴ H04N *5/14***

**U.S. Cl. 358—160** **10 Claims**




1. An electrical circuit for providing a non-addition signal mixing apparatus comprising:

a plurality of decoder means, each of said decoder means being adapted to receive digital video data in a form of a binary code and having a plurality of output lines, each of said decoder means applying an output signal to at least one of said output lines in response to said binary code, the number of said output lines corresponding to a possible value as expressed by said binary code;

matrix OR-circuit means for interconnecting corresponding output lines of said plurality of decoder means to produce corresponding OR outputs; and

encoder means for encoding said corresponding OR outputs into non-addition mixed data depending on a predetermined priority of said corresponding OR outputs.

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**4,611,234**

## ANALYSIS PROCESS OF A LINE TRANSFER PHOTOSENSITIVE DEVICE AND OPERATING DEVICE OF SUCH A PROCESS

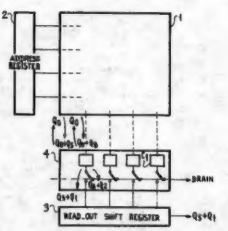
**Jean-Luc Berger, Grenoble; Louis Brissot, St. Egreve, and Yvon Cazaux, Grenoble, all of France, assignors to Thomson-CSF, Paris, France**

**Filed Dec. 16, 1983, Ser. No. 562,462**

**Claims priority, application France, Dec. 21, 1982, 82 21396; Sep. 9, 1983, 83 14403**

**Int. Cl.⁴ H04N *3/14***

**U.S. Cl. 358—213** **26 Claims**




1. Analysis process of a line transfer photosensitive device, this device comprising a photosensitive zone of M lines of N photosensitive points, wherein charge signals ($Q_S$) are produced proportional to received illumination of an image; the photosensitive points of the different lines being connected in parallel by conducting columns to a memory having N intermediary capacitances, said memory ensuring the transfer towards a read-out register of the charge-signal ($Q_S$) of a single

line and ensuring the transfer towards a drain of charge-noise ($Q_B$) present on the columns prior to the intake of the charge-signal wherein the analysis of each line of the photosensitive zone comprises the following steps:

transfer of the charge-signal ($Q_S$) towards the memory, by superimposing on the charge-signal at least a first training charge ($Q_O$), this first training charge ($Q_O$) being stored in the intermediary capacitances and transferred on the columns prior to the intake of the charge-signal and being sufficient to obtain in the columns, at the beginning of the transfer of the columns towards the intermediary capacitances a charge to be positioned in the high inclination zone of the characteristic Q(t) of the columns.

transfer of a second training charge ($Q_1$), superimposed on the charge-signal ($Q_S$) towards the read-out register, this second training charge ($Q_1$) being read with the charge-signal ($Q_S$) and being sufficient to obtain in the intermediary capacitances at the beginning of the transfer a charge to be positioned in the high inclination zone of the characteristic Q(t) of the intermediary capacitances.

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**4,611,235**

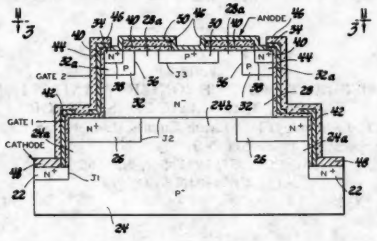
## THYRISTOR WITH TURN-OFF FET

**Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 4, 1984, Ser. No. 617,106**

**Int. Cl.[4] H01L** *29/72, 27/06, 29/08, 29/06*

**U.S. Cl. 357—38** **7 Claims**




7. A gate-controlled thyristor that not only has an IGFET for turn-on but also an IGFET and a space charge region effect for turn-off, the thyristor comprising:

a semiconductor body containing integrated bipolar PNP and NPN transistors that form a thyristor;

the collector region of one of the transistors having a portion overlapped, in a direction parallel to the direction of current flow in that collector region, by a portion of the collector region of the other transistor that is of higher conductivity than either the overlapped one transistor collector portion or the majority of the remaining portions of the other transistor collector region, to produce a PN junction that separates the two collector regions, and, if reversely biased, can inhibit majority carrier current flow through the collector region of said one transistor;

a first insulated gate electrode on said body, extending from the emitter region of the other transistor to the higher conductivity collector portion of the other transistor, so as to form a first integral IGFET electrically in parallel with the other transistor emitter and collector regions that is non-conducting unless a gate potential is applied to it;

a second insulated gate electrode on said body, extending from the higher conductivity collector portion of the other transistor, to a discrete region disposed in the remaining portions of the other transistor collector region, which discrete region is separated from said remaining portions of the other transistor collector region by a high electrical resistance, so as to form a second integral IGFET that is non-conducting unless a gate potential is applied to it;

a low resistance electrical connection between said discrete region of said second IGFET and the emitter region of the one transistor, effective to maintain said discrete region at essentially the same electrical potential applied to the one transistor emitter region;

an electrode on the one transistor emitter region for applying an electrical potential thereto that is opposite in polarity to that applied to the other transistor to emitter region;

an electrode on the other transistor emitter region for applying an electrical potential thereto that is opposite in polarity from that applied to the one transistor emitter region;

whereby, after the aforesaid electrical potentials are applied to said emitter region electrodes an electrical potential similar in polarity to that applied to the one transistor emitter region can be applied to the first gate electrode to turn on the thyristor and thereafter said similar polarity electrical potential can be applied to the second gate electrode to turn off the thyristor.

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**4,611,236**

## MASTERSLICE SEMICONDUCTOR DEVICE

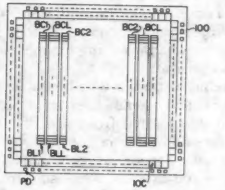
**Shinji Sato, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

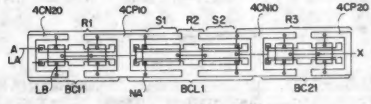
**Filed Jul. 6, 1984, Ser. No. 628,316**

**Claims priority, application Japan, Jul. 9, 1983, 58-125290**

**Int. Cl.[4] H01L** *27/10, 27/02*

**U.S. Cl. 357—45** **17 Claims**




1. A masterslice semiconductor device comprising

a substrate,

pluralities of first and second arrays of respective first and second basic cells on said substrate, each said array including a column of the respective basic cells aligned along a first direction, each said second array being located between respective ones of said first arrays, and each said basic cell of said second array having a higher current capacity than the basic cells of said first arrays, and

first wiring for defining unit cells including connections extending transversely to said first direction to connect between basic cells of each said first array and of at least one of a respective adjacent one of said second arrays and a respective other one of said first arrays, and

second wiring for respectively connecting together said unit cells to define an integrated circuit, including connections extending over said second arrays in said first direction.

**4,611,237**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

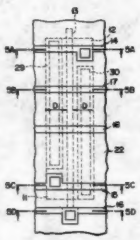
**Kazunori Ohuchi; Mitsugi Ogura, both of Yokohama, and Kenji Natori, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Continuation of Ser. No. 242,029, Mar. 9, 1981, abandoned. This application Jul. 30, 1984, Ser. No. 635,474**

**Claims priority, application Japan, Mar. 11, 1980, 55-30523**

**Int. Cl.[4] H01L** *29/78*

**U.S. Cl. 357—71** **3 Claims**



1. A seminconductor integrated circuit comprising:

source and drain regions of a MOS transistor provided in a semiconductor substrate;

a first insulation layer serving as a gate insulation layer and provided on the channel region between said source and drain regions;

a gate electrode provided on said first insulation layer;

a second insulation layer covering said source and drain regions and said gate electrode;

first and second conductive layers provided on said second insulation layer and contacting respective surfaces of said source and drain regions through respective contact holes formed through said second insulation layer;

a third insulation layer covering the main surface portion of said MOS transistor;

a source takeout electrode which contacts one end of said source region and extends over said third insulation layer, and which is separated from said first conductive layer provided on said source region;

a drain takeout electrode which contacts one end of said drain region and extends over said third insulation layer, and which is separated from said second conductive layer provided on said drain region; and

at least one interconnection layer provided on said third insulation layer and crossing said source and drain regions.

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**4,611,238**

## INTEGRATED CIRCUIT PACKAGE INCORPORATING LOW-STRESS OMNIDIRECTIONAL HEAT SINK

**Terrence E. Lewis; Stephen A. Smiley, both of San Diego; Rex Rice, Menlo Park; Zeev Lipkes, Poway, and John A. Nelson, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 646,478, Aug. 31, 1984, abandoned, which is a continuation of Ser. No. 375,069, May 5, 1982, abandoned. This application Jul. 15, 1985, Ser. No. 754,686**

**Int. Cl.[4] H01L** *23/36*

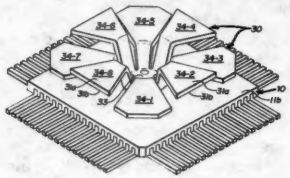
**U.S. Cl. 357—81** **11 Claims**

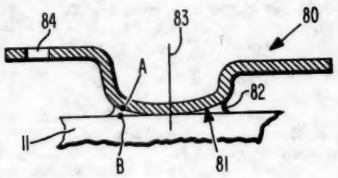
1. A heat sink for cooling an integrated circuit package, said heat sink comprising:

a single thin sheet of material having two oppositely facing major surfaces;

said major surfaces having a common perimeter defining a central section and a plurality of spaced-apart finger-shaped portions that extend radially from said central section;

said finger-shaped portions being formed to extend away from said central section to become cooling fins for said central section; and said central section having a convex





shape for attachment to a flat surface on said integrated circuit package with an adhesive of nonuniform thickness.

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**4,611,239**

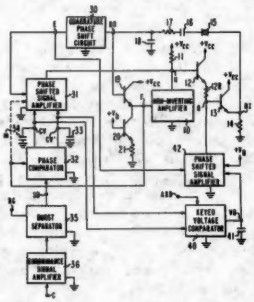
## OSCILLATOR SYNCHRONIZING SYSTEM FOR ELIMINATING STATIC PHASE ERRORS

**Robert L. Shanley, II, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.**

**Filed Oct. 31, 1984, Ser. No. 666,835**

**Int. Cl.[4] H04N** *9/45, 9/455*

**U.S. Cl. 358—19** **5 Claims**



1. In a color television receiver subject to reception of composite color television signals inclusive of deflection synchronizing components of respective line and field rates, and respective luminance and chrominance components, said chrominance component comprising color subcarrier waves modulated by color-difference signal information indicative of the coloring of a scene and accompanied by color synchronizing information in the form of bursts of oscillations of subcarrier frequency and reference phase recurring at a line rate; an oscillator synchronizing system comprising:

an oscillator comprising a non-inverting amplifier having an input terminal, and an output terminal, and a bandpass filter coupled between said output terminal and said input terminal;

a phase shifter having an input terminal coupled to receive signals from said oscillator and having an output terminal;

a phase comparator, having a first input terminal coupled to receive signals from said oscillator and a second input terminal coupled to receive said color synchronizing bursts, said phase comparator developing a first control voltage having an amplitude and polarity indicative of the magnitude and sense of any departure from a quadrature phase difference between the respective signals appearing at its input terminals;

first controlled means, responsive to signals appearing at said phase shifter output terminal and to said first control voltage, for delivering phase shifted signals to said bandpass filter with an amplitude and polarity dependent upon the amplitude and polarity of said first control voltage;

a charge storage capacitor;

keyed means, responsive to said first control voltage, for altering the charge stored by said capacitor in a first direction when said first control voltage exhibits a first polarity and in a second direction, opposite to said first direction, when said first control voltage exhibits a second polarity, during periodically recurring keying intervals; the magnitude of the charge alteration effected during a keying interval being dependent upon the magnitude of said first control voltage;

second controlled means, independent of said first controlled means, and responsive to signals appearing at said phase shifter output terminal, to a second control voltage derived from the voltage appearing across said charge storage capacitor, and to a reference DC voltage, for supplying to said bandpass filter additional phase shifted signals of a magnitude and polarity dependent upon the magnitude and sense of the difference, if any, between the respective magnitudes of said second control voltage and said reference DC voltage.

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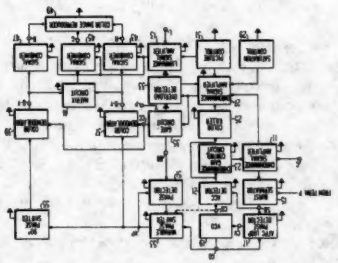
**4,611,240**

## CHROMINANCE PROCESSOR CONTROL SYSTEM

**Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.**

**Filed Mar. 28, 1984, Ser. No. 594,398**
**Int. Cl.[4] H04N 9/64**
**U.S. Cl. 358—23** **3 Claims**



1. In a color television receiver subject to reception of composite color television signals inclusive of respective luminance and chrominance components, said chrominance component comprising color subcarrier waves modulated by color-difference signal information indicative of the coloring of a scene and accompanied by color synchronizing information in the form of bursts of oscillations of subcarrier frequency and reference phase recurring at a line rate; chrominance component processing apparatus comprising:

a voltage controlled oscillator;

means for forming an AFPC loop for controlling the frequency and phase of oscillations developed by said voltage controlled oscillator, said AFPC loop forming means including a phase detector developing an oscillator control voltage having a magnitude and sense indicative of the magnitude and sense of any departure from a quadrature phase relationship between an output of said oscillator and said line rate bursts of the received chrominance component; said AFPC loop, in the presence of a difference between the free-running frequency of said oscillator and the frequency of said color subcarrier oscillation bursts, functioning to stabilize the operating frequency of said oscillator at a frequency altered from said free running frequency so as to match the frequency of said color subcarrier oscillation bursts, with said oscillator output, under such altered operating frequency conditions, exhibiting a departure from said quadrature phase relationship which constitutes a static phase error of a magnitude dependent upon the magnitude of said frequency difference;

a plurality of color demodulators, responsive to received modulated color subcarrier waves and to respective reference oscillations developed in response to an output of said oscillator, for recovering color-difference signal information from said received chrominance component;

means, responsive to said recovered color-difference signal information, for reproducing an image of said scene, wherein, during operation under said altered operating frequency condition, said reproduced image is subject to the appearance of errors in the image coloring in the absence of compensation for said static phase error; and

a static phase error compensation circuit including:

a variable phase shifter, external to said AFPC loop, having an input responsive to an output of said oscillator, and having an output from which said reference oscillations are derived; and

means, independent of said demodulators and responsive to the phasing of said line rate bursts, for automatically causing said variable phase shifter, during operation under said altered operating frequency condition, to alter the phasing of said reference oscillations in a direction tending to reduce the image coloring errors otherwise introduced by said static phase error;

wherein said last-named means comprises an additional phase detector, having a first input coupled to receive an output of said variable phase shifter and a second input coupled to receive only separated line rate bursts, for developing a phase shifter control voltage which is independent of the magnitude of said separated line rate bursts but is continuously representative of the phase relationship between said phase shifter output and said separated line rate bursts, said phase shifter control voltage being determinative of the phase shift introduced by said variable phase shifter.

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**4,611,241**

## PROJECTION TELEVISION SET UP METHOD AND APPARATUS

**William W. Albin, Itasca, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Oct. 12, 1983, Ser. No. 541,388**
**Int. Cl.[4] H04N 9/31**
**U.S. Cl. 358—60** **11 Claims**

1. A projection television system comprising:

a plurality of different colored light-emitting CRT's for projecting individual color images in overlying relationship on a remote viewing surface;

driver means supplying video signals to said CRT's;

pattern means for developing a distinct video signal; and

means for applying said distinct video signal to said driver means for producing a corresponding white vertical bar pattern, made up of different colored images, on said viewing surface for determining the proper distance between said CRT's and said viewing surface by observation of a departure of said different colored images from said overlying relationship in said white vertical bar pattern.

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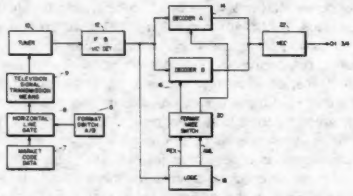
**4,611,242**

**TWO MODE SCRAMBLING SYSTEM USING IDENTIFIER PULSE IN VERTICAL BLANKING INTERVAL**

**Gregory A. Williams, Elk Grove Village, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Filed May 7, 1984, Ser. No. 607,988**
**Int. Cl.[4] H04N** *7/167, 7/10*
**U.S. Cl. 358—123** **5 Claims**



1. A television system comprising:

means for supplying television signal transmissions selectively encoded in one of two different formats A and B;

means supplying market code information on one of two horizontal lines in the vertical intervals of said television signal transmissions;

means for receiving said television signal transmissions and said market code information;

means developing an identifier pulse from said market code information; and

format mode means including a decoder A and a decoder B responsive to said identifier pulse for selectively decoding said television signal transmissions, the selected one of said two horizontal lines bearing said market code information in the vertical blanking interval of the television signal transmission determining whether the television signal transmission is encoded in format A or in format B.

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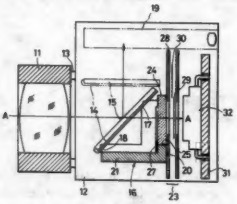
**4,611,243**

**ELECTRONIC CAMERA HAVING IMPROVED SUPPORT FOR OPTICAL LOW-PASS FILTER**

**Tahei Morisawa, and Harumi Aoki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan**

**Filed Apr. 30, 1984, Ser. No. 605,546**
**Claims priority, application Japan, Apr. 30, 1983, 58-76473**
**Int. Cl.[4] H04N** *5/30*
**U.S. Cl. 358—225** **2 Claims**



1. In an electronic camera of a type having, in order, an objective lens, a retractable image reflecting mirror, a focal plane shutter, and an electronic image pickup device, and an optical low-pass filter disposed in an optical path between said objective lens and said image pickup device, the improvement comprising:

means for positioning said optical low-pass filter between said mirror and said optical plane shutter;

said positioning means comprising a supporting frame which comprises a detachable holding plate for securing said optical low-pass filter to said frame, a base portion extending parallel to an optical axis of said objective lens, a filter holding portion adapted to receive said low-pass filter extending upwardly from a rear end of said base portion and to which said holding plate is secured, and first and second side portions disposed on opposite sides of said base portion and said filter holding portion and extending perpendicular thereto, said side surface portions having at least a pair of surfaces for supporting said retractable mirror at an angle of substantially 45 degrees in a lowered position of said mirror.

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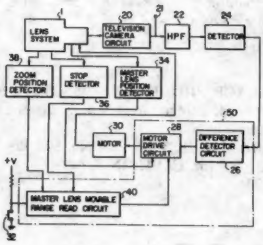
**4,611,244**

**AUTO-FOCUS SYSTEM FOR VIDEO CAMERA**

**Kentaro Hanma, and Toshio Murakami, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 377,438, May 12, 1982, abandoned.**
**This application Jun. 21, 1984, Ser. No. 623,082**
**Claims priority, application Japan, May 13, 1981, 56-70720**
**Int. Cl.[4] H04N** *3/26*
**U.S. Cl. 358—227** **22 Claims**



1. An auto-focus system for a video camera having a lens system comprising an objective lens located at the front of a zoom lens system to receive an optical image from an object being photographed and a master lens located between said zoom lens system and an image pickup unit of said video camera, said auto-focus system comprising:

means for generating an auto-focus signal in accordance with the fineness of said optical image for said video camera;

a motor for moving at least a part of the master lens of said lens system;

motor control means for performing an auto-focus operation by controlling said motor to move the position of said master lens to focus the lens system in accordance with said auto-focus signal;

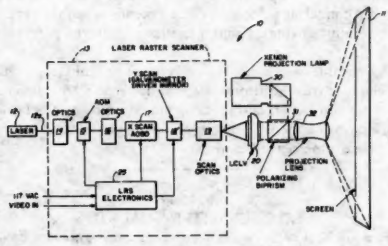
switch means being changeable selectivly between a first and a second mode for instructing photographing over a normal distance range and over a macroscopic range respectively; and

master lens movable range control means for controlling said motor control means to decide a movable range of said master lens in accordance with the selected mode of said switch means and to thereby control said motor control means to limit the movement of said master lens to be within the decided movable range.

## 4,611,245
## REAL-TIME ULTRA-HIGH RESOLUTION IMAGE PROJECTION DISPLAY USING LASER-ADDRESSED LIQUID CRYSTAL LIGHT VALVE

**John Trias, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 29, 1984, Ser. No. 643,216**
**Int. Cl.[4] H04N *5/74***
**U.S. Cl. 358—235** **11 Claims**




1. An improved apparatus for displaying real-time, ultra-high resolution projected images on a distant screen in accordance with video image signal rates comprising:

a laser providing a beam of coherent light;

means located to receive the beam of coherent light for modulating it at video image signal rates;

means disposed to receive the video rate modulated coherent light beam from the modulating means for reciprocally imparting a scan thereof in an X-direction;

means disposed to receive the X-direction reciprically scanned modulated coherent light beam for reciprocally imparting a scan thereof in a Y-direction;

means coupled to the modulating means, the X-direction scan reciprocally imparting means and the Y-direction scan reciprocally imparting means for acousto electronically controlling the modulation, the X-direction scan and the Y-direction scan, respectfully;

means aligned to receive the X- and Y-direction reciprocally scanned modulated coherent light beam for selectively changing the polarization orientation of linearly polarized light incident thereon in direct response to the voltage pattern directly produced therein by X- and Y-direction reciprocally scanned modulated coherent light beam;

means disposed for projecting a high intensity light beam in a light path to the light polarization orientation changing means; and

means interposed in the light path between the light polarization orientation changing means and the high intensity light beam projecting means for reflecting linearly polarized high intensity light onto the light polarization orientation changing means and for directing modulated reflected high intensity light modulated in accordance with the X- and Y-direction reciprocally scanned modulated coherent light beam onto the distant screen in the form of the real-time, high-resolution images at video image signal rates.

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## 4,611,246
## HANDY READER/PRINTER APPARATUS

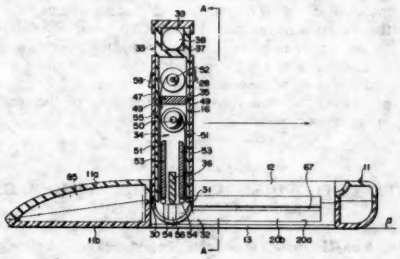
**Kazuhiro Nihei, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Oct. 21, 1985, Ser. No. 789,617**
**Claims priority, application Japan, Nov. 14, 1984, 59-240352**
**Int. Cl.[4] H04N *1/00***
**U.S. Cl. 358—256** **13 Claims**

1. A handy reader/printer apparatus for reading recorded information from a desired portion of a medium to be read and printing read information in a desired portion of a medium to be printed, said apparatus comprising:

a housing having an opening in a lower surface thereof and placed on the medium to be read or printed such that the desired portion of the medium can be fitted in the opening;

a reader unit, arranged in said housing, for reading the recorded information of the desired portion of the medium to be read fitted in the opening while said housing is placed on the medium;



a printer unit, arranged in said housing, for printing data, previously read, in the desired portion of the medium to be printed, fitted in the opening while the housing is placed on the medium;

a memory for storing data read by said reader unit upon operation of said reader unit; and

a readout unit for reading out the storage data from said memory and supplying the readout data as the printing data to said printer unit upon operation of said printer unit.

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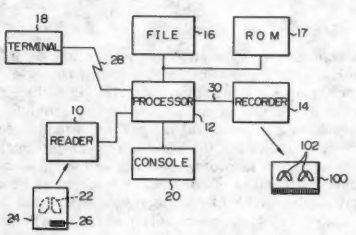
## 4,611,247
## RADIATION IMAGE REPRODUCING APPARATUS

**Masamitsu Ishida; Eiichi Asai, and Nobuaki Higashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan**

**Filed Aug. 8, 1983, Ser. No. 521,507**
**Claims priority, application Japan, Aug. 9, 1982, 57-137346**
**Int. Cl.[4] H04N *1/40, 5/30, 5/32***
**U.S. Cl. 358—280** **6 Claims**




1. A radiation image reproducing apparatus comprising:

reading means for sensing a radiation image stored in a first recording medium;

processing means for performing image processings on the radiation image sensed by said reading means;

recording means interconnected to said processing means for recording the processed image on a second recording medium as a visible image;

input means for receiving input data indicative of a method of exposing an object to the first recording means and the part of the object under exposure;

first storage means for storing optimum processing condi-

tions associated with the data indicative of the method of exposure and the part under exposure; and

second storage means for storing said input data;

said input data including identification data for identifying the first recording medium;

said processing means including means for controlling said reading means, recording means, input means, and first and second storage means;

said processing means further including means for causing said input means to receive the identification data associated with the radiation image stored in the first storage medium, means for causing said reading means to sense the radiation image stored in the first recording medium, means for reading out of said first storage means the optimum conditions for the method of exposure and the part under exposure associated with the sensed image and processing the sensed image on the basis of the readout optimum conditions.

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## 4,611,248

## ROTARY RECORDING MEDIUM AND REPRODUCING APPARATUS THEREFOR

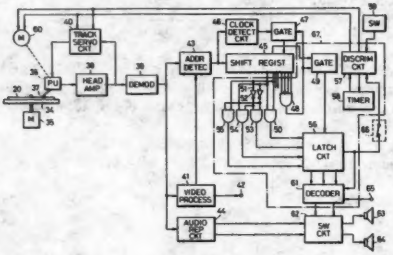
**Yoshihiko Honjo, Ayase; Hisayoshi Yamada, Kamakura; Kazuhiro Hosono, Yokohama; Masaki Sakurai, Yokohama; Ryozo Abe, Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Continuation of Ser. No. 394,317, Jul. 1, 1982, abandoned. This application Jul. 24, 1985, Ser. No. 758,564**

**Claims priority, application Japan, Jul. 6, 1981, 56-105361; Jul. 6, 1981, 56-105362**

**Int. Cl.⁴ H04N** *5/91*

**U.S. Cl. 358—342** **5 Claims**




3. A reproducing apparatus for reproducing recorded signals from a rotary recording medium, said rotary recording medium having a spiral track on a recording surface thereof, said spiral track having an address signal and information signals including at least a video signal recorded thereon, said address signal indicating the position of said information signals on said rotary recording medium, said spiral track being made up of a plurality of consecutive track turns, each track turn having four fields of the video signal recorded thereon, said track turns including specific track turns which have a stop signal recorded thereon, said stop signal being recorded together with said address signal within vertical blanking periods of the video signal, said stop signal indicating that each of said specific track turns is to be scanned repeatedly for a predetermined time period so that a still picture is reproduced from each of said specific track turns, said stop signal being a stop code which is constituted by predetermined bits of said address signal, said reproducing apparatus comprising:

a reproducing element for reproducing the recorded signals from said rotary recording medium by scanning over said spiral track;

address signal detecting means responsive to said reproducing element for detecting said address signal from the reproduced signals;

stop code detecting means responsive to said address signal detecting means for detecting said stop code from among the address signal;

timer means for setting said predetermined time period;

circuit means responsive to said stop code detecting means for causing said reproducing element to repeatedly scan over each of said specific track turns having the stop code recorded thereon, said repeated scanning continuing for said predetermined time period with respect to each of said specific track turns so that a still picture is reproduced from each of said specific track turns; and

manually operated stop cancel button means for supplying a stop cancel signal to said circuit means when the repetitive scanning of one of said specific track turns is to be cancelled,

said circuit means immediately shifting said reproducing element from said one specific track turn to a successive track turn when said predetermined time period elapses or said stop cancel signal is received before said predetermined time period elapses.

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## 4,611,249

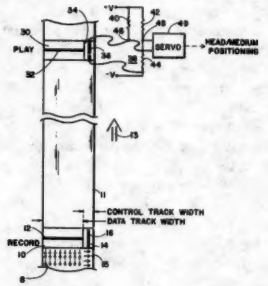
## FLUX SENSITIVE TRACKING

**Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 3, 1985, Ser. No. 730,139**

**Int. Cl.⁴ G11B** *5/56*

**U.S. Cl. 360—77** **5 Claims**




1. A magnetic recording medium having therein

a. a data recording track in which the particles thereof are magnetized in the direction of the length of said track and

b. a control track in which the particles thereof are magnetized in a direction which is substantially cross-wise with respect to the length of said control track,

the magnetization of the particles of said control track alternating directionally along the length of said control track.

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## 4,611,250

## APPARATUS FOR RECORDING A VIDEO SIGNAL

**Tadaaki Yoshinaka, and Toshiaki Noguchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Dec. 15, 1983, Ser. No. 561,783**

**Claims priority, application Japan, Dec. 17, 1982, 57-222294**

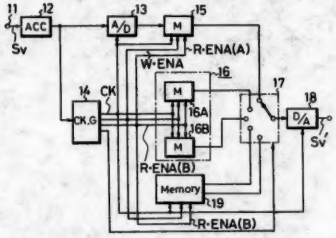
**Int. Cl.⁴ H04N** *5/92*

**U.S. Cl. 360—9.1** **13 Claims**

1. An apparatus for recording a video signal on magnetic tape which is helically wrapped on a guide drum having a single rotary head for scanning successive recording tracks on said magnetic tape, the head contacting the tape during an interval in each revolution of the head and being out of contact with the tape during the remainder of each revolution, the apparatus comprising:

means for dividing each field of said video signal into N segments, where N is a positive integer greater than one,

and time-compressing each of said N segments so that each of said segments corresponds to said interval during which said single rotary head contacts said magnetic tape in each revolution; and




means whereby said single rotary head sequentially and respectively records said N segments on N recording tracks on said magnetic tape.

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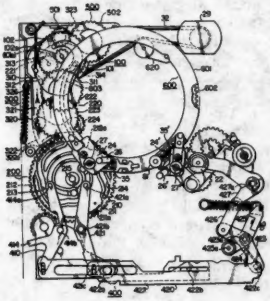
**4,611,251**

## TRANSMISSION CHANGE-OVER MECHANISM FOR SELECTIVELY DRIVING AUTOMATIC-LOADING AND TAPE-OPERATION MEANS IN A MAGNETIC RECORDING AND REPRODUCING APPARATUS

**Shouzou Yokoo, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 29, 1983, Ser. No. 536,873**
**Claims priority, application Japan, Oct. 1, 1982, 57-170988**
**Int. Cl.[4] G11B** *5/08, 15/00*
**U.S. Cl. 360—85** **4 Claims**



1. A magnetic recording and reproducing apparatus comprising:
- a motor;
- a first driving means adapted to be driven by the power of said motor;
- a tape operation mechanism means including a tape pressing mechanism for urging a pinch roller against a capstan;
- a tape loading mechanism;
- a second driving means operable by the power of said first driving means to actuate said tape operation mechanism means;
- a third driving means operable by the power of said first driving means to actuate said tape loading mechanism; and
- a driving power transmission change-over mechanism operative to control the transmission of the driving power of said first driving means to said tape loading mechanism and to said tape operation mechanism means and includind a first change-over means operatively connected to said tape loading mechanism and being responsive to operation modes of said tape loading mechanism to drivingly connect and disconnect said first driving means to and from said second driving means and a second change-over means operatively connected to said tape operation mechanism means and being responsive to operation modes of said tape operation mechanism means to drivingly connect and disconnect said first driving means to and from said third driving means, wherein said tape operation mechanism means includes an operation cam means, said second driving means comprises a first group of gears rotatable in response to the torque of said first driving means to drive said operation cam means of said tape operation mechanism means, and said third driving means comprises a second group of gears rotatable in response to the torque of said first driving means to drive said tape loading mechanism.

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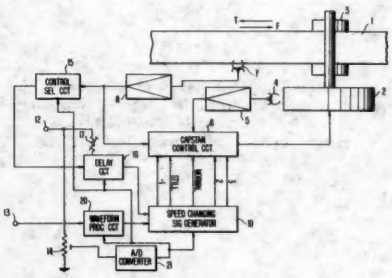
**4,611,252**

## VIDEO TAPE RECORDER

**Kouichi Igata, Hirakata, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 15, 1983, Ser. No. 504,513**
**Claims priority, application Japan, Jun. 16, 1982, 57-104218**
**Int. Cl.[4] H04N** *5/783;* **G11B** *15/46*
**U.S. Cl. 360—10.3** **6 Claims**




1. A video tape recorder comprising:
- a magnetic tape drive means including a capstan motor and a pinch roller for driving a magnetic tape having frames recorded therein;
- a control means for controlling said drive means so as to move said magnetic tape at constant speeds including a normal speed, a twofold speed, a threefold speed in forward reproduction, and a normal speed in reverse reproduction, and for keeping said magnetic tape stationary for still reproduction;
- a speed setting means for setting any speed within a range of from said normal speed in reverse reproduction to said threefold speed in forward reproduction;
- a control signal reproducing means for reproducing control signals recorded on said magnetic tape at intervals of one-frame period;
- a control signal selection means for selecting a control signal from said reproduced control signals according to an output signal of said speed setting means;
- a time setting means for producing a signal delayed by a predetermined time period from said control signal selected by said control signal selection means according to said output signal of said speed setting means;
- a waveform processing means for producing a signal by processing a waveform of a head switching pulse used for switching rotatable heads of said recorder according to said output signal of said speed setting means; and
- a speed changing means for alternately producing two command signals selected from command signals which are respectively indicative of said speeds in a time period corresponding to a few of said frames according to said

output signal of said speed setting means, said two command signals being applied to said control means so that said control means controls said drive means so as to move said magnetic tape alternately at speeds indicated by said two command signals such that said magnetic tape moves at a speed between said speeds indicated by said two command signals;

wherein a first of said two command signals are produced in response to said signal produced by said time setting means and a second of said two command signals are reproduced in response to said signal produced by said waveform processing means, said first command signal indicating a speed slower than that indicated by said second command signal.

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## 4,611,253

## MAGNETIC RECORDING AND REPRODUCING DEVICE

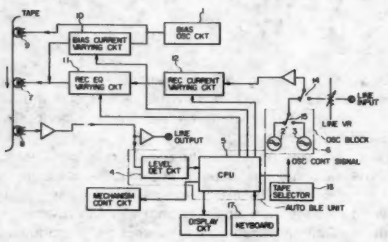
**Kazuo Kamei, and Toshiharu Iida, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jun. 27, 1984, Ser. No. 625,141**

**Claims priority, application Japan, Jun. 28, 1983, 59-99852[U]; Jun. 28, 1983, 59-116669**

**Int. Cl.⁴ G11B *5/03, 5/02***

**U.S. Cl. 360—66** **8 Claims**




1. A magnetic recording and reproducing device in which an optimum bias current is set, comprising:

means for varying a recording bias current at predetermined time intervals;

a variable low-frequency oscillator for supplying one of a plurality of low-frequency signals upon which said recording bias current is superposed to be magnetically recorded;

means for detecting a maximum value of a reproduced signal of said magnetically recorded signal and setting said recording bias current varying means to supply an optimum recording bias current corresponding to said maximum value of said reproduced signal; and

means for switching said variable low-frequency oscillator to select one of said plurality of low-frequency signals as an optimum frequency for setting said recording bias current varying means, said switching means comprising means for switching said variable low-frequency oscillator to oscillate at an optimum frequency depending upon a type of magnetic medium employed.

## 4,611,254

## CONTROL MECHANISM FOR A MAGNETIC-TAPE-CASSETTE APPARATUS

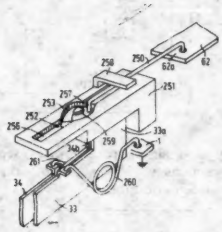
**Klaus Kommoss, Wetzlar-Naunheim; Karl Klös, Ruttershausen; Hans W. Dietz, Ehringshausen, and Thomas H. W. Köppeler, Fronhausen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 4, 1984, Ser. No. 657,645**

**Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337359**

**Int. Cl.⁴ G11B *15/10***

**U.S. Cl. 360—69** **9 Claims**




1. A control mechanism for a magnetic-tape-cassette apparatus, said mechanism comprising two adjacent axially movable actuating rods for switching two different operating modes of the apparatus, a servo motor and a servo rod axially reciprocable by means of said motor, the improvement comprising a command member connected to said servo rod for movement therewith, a basically closed guideway which branches into a first and a second command track and drive portions of said actuating rods, each located in an associated command track, said command member carrying a command pin which can travel in said guideway in one predetermined direction only, said command pin as it travels in the first or the second command track driving the drive portion of a corresponding actuating rod so as to move said rod.

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## 4,611,255

## ROTATING HEAD ASSEMBLY

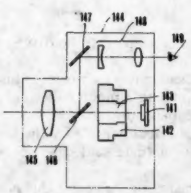
**Tatsuzo Ushiro, Tokyo; Takashi Narasawa, Kanagawa; Makoto Fujiki, and Hiroo Edakubo, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 20, 1982, Ser. No. 400,081**

**Claims priority, application Japan, Jul. 28, 1981, 56-117095; Jul. 28, 1981, 56-117096; Jul. 28, 1981, 56-117097; Jul. 28, 1981, 56-117098; Aug. 12, 1981, 56-125281; Aug. 12, 1981, 56-125282; Dec. 9, 1981, 56-196880**

**Int. Cl.⁴ G11B *5/027***

**U.S. Cl. 360—84** **14 Claims**




1. A rotating system, comprising:

(a) a stationary member;

(b) a rotating member continuously rotatable relative to said stationary member, said rotating member having at least one head for recording and/or reproducing information signals on and/or from a recording medium, said rotating member having an opening for passage of light therethrough;

(c) supporting means for rotatably supporting said rotating member relative to said first stationary member; and
(d) optical means for processing said light into recordable information signals, at least one portion of said optical means being arranged in the direction of the passage of light through the opening.

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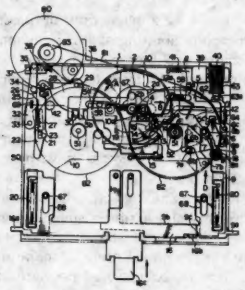
**4,611,256**

## EJECTION MECHANISM FOR A TAPE RECORDER

**Fumio Tsujimura, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan**

**Filed Oct. 24, 1983, Ser. No. 544,773**
**Claims priority, application Japan, Nov. 30, 1982, 57-208599**
**Int. Cl.[4] G11B *15/66***
**U.S. Cl. 360—96.6** **2 Claims**



1. An ejection mechanism for a tape recorder comprising:
a motor;
a driving gear driven by said motor;
an intermittent gear having an intermittent portion disposed so as to engage with said driving gear;
a cam portion disposed on said intermittent gear;
a commuting element (5) having a follower which is in contact with said cam portion so as to be driven between extreme positions by rotation of said intermittent gear by said driving gear;
an operational link (6) interlocked to be driven by said commuting element;
an eject link (7) disposed so as to be able to engage with said operation link to be driven by the motion thereof;
an eject member (9) connected to be driven by the motion of said eject link;
an eject element (48) interlocked with said eject member;
a cassette guide (46) for receiving an inserted cassette;
a pivotally mounted frame (44) coupled to said cassette guide so as to raise and lower said cassette guide responsively to the movement of said frame, said frame being operable between a raised position disengaging an inserted cassette from a set of reelbase drives of said recorder and a seated position effectuating engagement therewith;
first spring bias means (56,45) for urging said frame to said seated position, said eject element being coupled to said frame so that movement of said eject element in a given direction by said eject member urges said frame against said first spring bias means to said raised position;
a pivotally mounted swing lever (43) having a cam edge (143) at its extremity configured to arrestingly engage portions (44*b*) of said pivotal frame in the raised position thereof over a range of latching orientations of said swing lever and to remove said arresting engagement therefrom at a terminal released orientation of said swing lever; and
second spring bias means for urging said swing lever from said terminal orientation through said range of latching orientations thereof, said swing lever including an arresting portion (143*b*) urged by said second spring bias means to oppose the insertion of a cassette into said cassette guide so that with said frame in a raised position insertion of said cassette urges said swing lever through said range of latching orientations to said released orientation, and so that when said frame is moved to said raised position said swing lever moves through said range of latching orientations to ejectingly urge said cassette out of said cassette guide.

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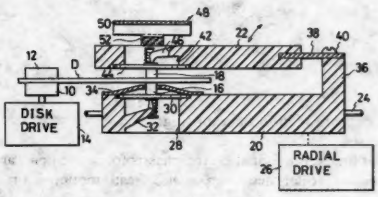
**4,611,257**

## VIBRATION CONTROLLED DATA TRANSFER APPARATUS WITH A DOUBLE SIDED FLEXIBLE MAGNETIC DISK

**Kazuhiko Shiroyama; Tamotsu Haraguchi, both of Musashino, and Yoshiaki Sakai, Higashikurume, all of Japan, assignors to Teac Corporation, Tokyo, Japan**

**Filed Aug. 18, 1983, Ser. No. 524,364**
**Int. Cl.[4] G11B *5/48***
**U.S. Cl. 360—104** **11 Claims**



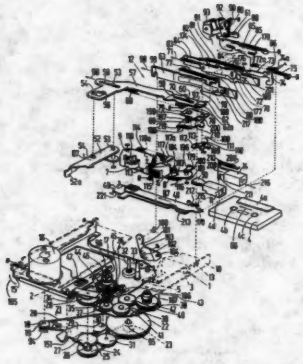

1. In a data transfer apparatus for use with a thin flexible magnetic disk having magnetic recording surfaces on both sides thereof, in combination:
(a) a carriage movable substantially radially of the magnetic disk;
(b) a first transducer head mounted on the carriage for movement therewith in data transducing contact with one recording surface of the magnetic disk;
(c) a second transducer head disposed opposite to the first transducer head and on the opposite side of the magnetic disk with respect to the first transducer head;
(d) resilient means including a cantilever spring;
(e) a carrier arm of rigid material carrying the second transducer head and mounted to the carriage via the cantilever spring for joint movement with the carriage, the resilient means acting on the rigid carrier arm to bias the second transducer head into data transducing contact with the other recording surface of the magnetic disk;
(f) an elastic mount bonded to the rigid carrier arm and adapted to dampen inherent vibration in said apparatus by virtue of volumetric change in said elastic mount; and
(g) a member of rigid material floatingly mounted on the rigid carrier arm via the elastic mount by being bonded to the latter;
(h) the floating rigid member and the elastic mount serving in combination to dampen the resonant vibration of the rigid carrier arm due to the data transducing contact of the transducer heads with the magnetic disk.

**4,611,258**

## CASSETTE RECORDER WITH LOW-ENERGY PAUSE CONTROL

**Lucas W. M. Schijven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 399,931, Jul. 19, 1982, Pat. No. 4,561,030. This application Apr. 11, 1985, Ser. No. 721,972**
**Claims priority, application Netherlands, Aug. 17, 1981, 8103831**
**Int. Cl.[4] G11B *5/54, 21/22***
**U.S. Cl. 360—105** **21 Claims**



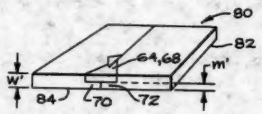
1. A cassette recorder comprising:
a chassis,
a head bracket mounted on the chassis for movement, and a pressure roller and a magnetic head mounted on the bracket,
an ejection spring,
a cassette compartment for receiving a magnetic cassette, said compartment including a pivotably mounted ejection lever which upon insertion of a cassette is pivoted in an insertion direction to tension the ejection spring,
a capstan arranged for driving a magnetic tape in a cassette placed in the compartment, and drive means for the capstan and for transporting the tape past the magnetic head,
switching means for moving the head bracket toward the cassette,
latching means for keeping the ejection spring in the tensioned condition, and
means for actuating said latching means to release the ejection spring so as to pivot the lever in an ejection direction,
characterized in that said switching means comprises:
a play bracket movable to and from a play position,
a pause spring connected to said movable play bracket,
means for moving said play bracket toward the play position and tensioning the pause spring upon movement of said lever in the insertion direction,
a pause latch for latching the play bracket in the play position when the pause spring is tensioned,
means for releasing the pause latch independently of said latching means, and
means for coupling the play bracket to the head bracket for moving the head bracket away from but not out of the cassette in response to release of the pause latch while said latching means keeps the ejection spring in the tensioned condition.

**4,611,259**

## MAGNETIC TRANSDUCER STRUCTURE HAVING REDUCED TRACK WIDTH AND A METHOD OF MANUFACTURING THEREOF

**Edward Schiller, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Feb. 8, 1983, Ser. No. 464,844**
**Int. Cl.[4] G11B *5/12***
**U.S. Cl. 360—125** **38 Claims**




1. A method of making a magnetic transducer having confronting magnetic poles abutting at a transducing gap plane to define a transducing gap therebetween, said abutting poles having a width reduced at a transducer-to-recording medium surface to define a reduced transducing gap width with respect to the width of said transducer, comprising the steps of:
providing a notch inwardly of said transducer-to-recording medium surface, and transversely with respect to said transducing gap plane;
providing a nonmagnetic, electrically insulating material having a viscosity and hardness similar to glass; and
heating said nonmagnetic material at least to a softening temperature but below a melting temperature thereof and applying thereto a concentrated pressure at least at one discrete location to enhance flow thereof into said notch.

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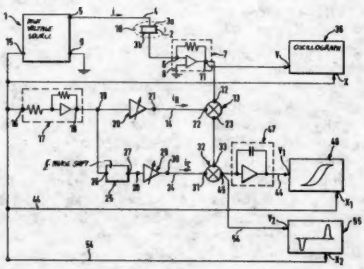
**4,611,260**

## METHOD AND DEVICE FOR POLARIZING FERROELECTRIC MATERIALS

**Francois Bauer, Saint Louis, France, assignor to Deutsch-Franzosisches-Forschungsinstitut, Saint Louis, France**

**Filed Dec. 15, 1983, Ser. No. 561,667**
**Claims priority, application France, Dec. 15, 1982, 82 21025**
**Int. Cl.[4] H04R *17/00***
**U.S. Cl. 361—233** **13 Claims**



1. The method of polarizing ferroelectric materials, having a coercive force $E_C$ up to a predetermined polarization level characterized by the steps of:
(a) applying to the ferroelectric material an alternating electric field E whose frequency ranges from 0.001 to 1 Hz, while increasing the field gradually between 0 and $\pm E_N$, where $E_N$ is slightly in excess of the coercive force $E_C$ of the material;
(b) simultaneously measuring the intensity i of the current traversing the material as a function of the field E using a display unit until a stable curve $i=f(E)$ is achieved.

## 4,611,261
## ELECTRONIC EQUIPMENT

**Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

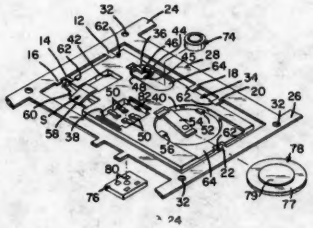
**Filed Sep. 14, 1983, Ser. No. 532,092**
**Claims priority, application Japan, Sep. 21, 1982, 57-163167; Sep. 21, 1982, 57-163168; Sep. 21, 1982, 57-163169**
**Int. Cl.[4] H05K *1/18***
**U.S. Cl. 361—399** **6 Claims**

1. Electronic equipment comprising:
a frame body made of high molecular material;
a metal plate, having substantially the same peripheral shape as said frame body, insert-molded into said frame body to be sandwiched therein thereby to comprise a frame member having upper and lower surfaces, said metal plate being thin and being formed with a plurality of movable contacts divided into a plurality of groups and with a plurality of connection terminals for interconnecting said plurality of groups;
means having a plurality of key inputting areas for covering said upper surface of said frame member
printed circuit means having a key input circuit adapted to be closed by a depression force from said key inputting areas; and
electronic parts connected to said printed circuit means;
at least a portion of said connection terminals being severed electrically to isolate adjacent groups of said contacts, and at least a portion of said connection terminals being severed and bent continuously to make electrical connection with said printed circuit means;
said frame member further having convey means for conveying the depression force from said key inputting area to said printed circuit means.

## 4,611,262
## ELECTRICAL CIRCUIT PACKAGE FOR GREETING CARDS

**Michael D. Galloway, Middletown; William H. Rose, and David T. Shaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed May 11, 1984, Ser. No. 609,164**
**Int. Cl.[4] H05K *5/02***
**U.S. Cl. 361—421** **13 Claims**

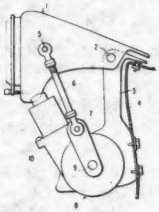


1. An electrical circuit package, comprising:
a stamped and formed metal lead frame including metal strips defining circuit paths for forming an electrical circuit; and
a dielectric housing member secured onto said lead frame such that said circuit paths are insulatingly disposed in and supported by said housing member, said housing member having component-receiving openings in which electrical contact members of said metal strips are exposed in cooperating arrangements so that some of said exposed contact members serve to support leadless electrical components in respective said openings and to make electrical contact therewith while other of said exposed contact members in said openings electrically engage said electrical components and maintain them in said openings.

## 4,611,263
## ADJUSTING DEVICE FOR THE OPTICAL AXIS OF A HEADLAMP BEAM

**Taneichi Kawai, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan**

**Filed Aug. 3, 1984, Ser. No. 637,253**
**Claims priority, application Japan, Aug. 6, 1983, 58-144142; Aug. 7, 1983, 58-144270; Feb. 23, 1984, 59-32923**
**Int. Cl.[4] B60Q *1/10***
**U.S. Cl. 362—71** **9 Claims**



1. A device for adjusting the optical axis of a headlamp beam, comprising:
a bracket adapted to be mounted to an automobile frame;
a headlamp pivotably mounted on said bracket;
a lamp link fixed to said headlamp;
a motor mounted to said bracket and having a rotatable shaft;
a link mechanism operatively connected to and extending between said lamp link and said rotatable shaft;
motor control means including;
means for detecting an inclination angle of said headlamp, and
means for instructing an inclination angle of said headlamp, said instructed inclination angle being one of a lowered inclination angle and of a plurality of closely spaced inclination angles near a raised inclination angle, said motor being responsive to said instructing means for any of said instructed inclination angles; and
current supply regulator means for regulating the current to said motor, said regulator means comprising a resistor switchably connectable in series with said motor to vary said inclination angle when said resistor is connected and means for switching said resistor into and out of the current path of said motor.

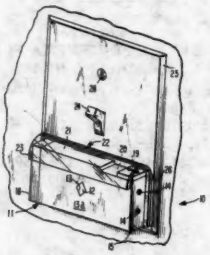
## 4,611,264
## COMBINATION SWITCH LIGHT AND RECHARGEABLE FLASHLIGHT

**Morgan B. Bradley, 15725 Spanaway Loop Rd., Spanaway, Wash. 98387**

**Filed May 4, 1983, Ser. No. 491,398**
**Int. Cl.[4] F21V *33/00*; F21L *7/00***
**U.S. Cl. 362—95** **1 Claim**

1. A combination switch light and rechargeable flashlight, comprising a rectangular housing, a battery and an electric lamp bulb inside said housing, a lamp light opening in one end wall of said housing, a pair of female jacks on an opposite end wall of said housing in electrical circuit with said battery and said bulb, a slide switch in a recess on a top wall of said housing being in said circuit, a mounting plate adjacent a rear side of said housing having a rolled over upper end enclosing said slide switch, a velcro loop pile fastener pad on a rear side of

said housing and a velcro loop pile fastener pad on the front side of said mounting plate for selective detachable attachment of said housing on said mounting plate, and a wall switch plate fixedly secured by adhesive means to a rear side of said mounting plate; and a small night light second lamp bulb also inside said housing and in circuit with said battery, said second lamp bulb being behind a lens in a diamond-shaped opening on a front side of said housing, said front side being a longitudinal side of said flashlight.



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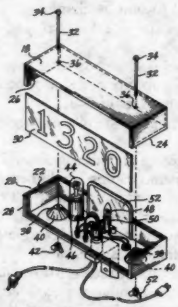
**4,611,265**

## LIGHTED ADDRESS DISPLAY WITH EMERGENCY SIGNAL SYSTEM

**Dennis G. Davis, 4428 S. 348th Pl., Auburn, Wash. 98001**

**Filed Aug. 20, 1984, Ser. No. 642,169**
**Int. Cl.[4] F21S *1/14***
**U.S. Cl. 362—145** **4 Claims**



1. A combined address display and emergency signaling means for use on a house or building, comprising:

a housing having an exterior sidewall of translucent material on which address indicia appears;

a light source inside of said housing for lighting the translucent material, to display the address indicia; and

an emergency signaling means including a flashing emergency light means within the housing, reflector means behind said emergency light means, positioned to reflect light towards the translucent wall, and a control circuit means operable by a person or condition inside of the house or building, for turning on the emergency light, to cause the address display to flash on and off so that a neighbor or passerby, etc. can see that help is needed inside of the house or building, said emergency signaling means comprising a light bulb mounted within the housing in a position spaced inwardly of the housing from a central portion of the translucent panel, said reflector means comprising a substantially planar reflecting surface of such an area that a majority of the light emitted towards the reflector means side of the light bulb strikes the reflecting surface, said reflector means being positioned substantially immediately behind the light bulb, and said light bulb being positioned closely adjacent the center of said reflective surface, both horizontally and vertically.

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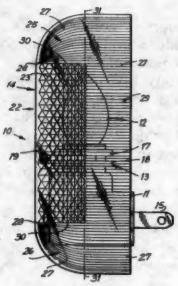
**4,611,266**

## REFRACTOR FOR ELECTRIC LIGHT WALL UNIT

**Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.**

**Filed Jul. 19, 1985, Ser. No. 756,542**
**Int. Cl.[4] F21V *5/02***
**U.S. Cl. 362—226** **8 Claims**



1. A light refractor for a plug-in, electric light wall unit, comprising a light transmissive body having a plurality of surface sections having light diffusing patterns thereon, including:

a semi-cylindrical surface having a diamond-studded type of texture; and

a pair of quarterly-spherical surfaces respectively bordering upon said semi-cylindrical surface and having saw-toothed type striations substantially radiating from a center point upon a demarcation between said quarterly-spherical surfaces and said semi-cylindrical surface.

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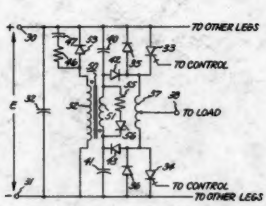
**4,611,267**

## SNUBBER ARRANGEMENTS WITH ENERGY RECOVERY FOR POWER CONVERTERS USING SELF-EXTINGUISHING DEVICES

**William McMurray, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 25, 1985, Ser. No. 705,259**
**Int. Cl.[4] H02M *7/125***
**U.S. Cl. 363—58** **8 Claims**




2. In a DC source fed power converter, a leg connected across said DC source comprising:

first and second switching devices coupled to opposite sides of said DC source, respectively;

first and second feedback diodes each coupled in anti-parallel with said first and second switching devices, respectively;

first and second series inductive snubbers connected to said first and second switching devices, respectively;

first and second shunt capacitive snubbers connected in parallel with said first and second switching devices, respectively;

a recovery transformer for restoring snubber energy to said DC source following a commutation of said leg, the primary winding of said transformer coupling said first shunt capacitive snubber to said second shunt capacitive snubber, the secondary winding of said transformer being coupled to one side of said DC source;

a recovery diode coupling said secondary winding to the other side of said DC source;

first and second unidirectional conducting devices for polarizing the charging and discharging of said series and said shunt snubbers, said first unidirectional conducting device coupling the junction of said first shunt capacitive snubber and said primary winding to said first series inductive snubber, and said second unidirectional conducting device coupling the junction of said second shuntcapacitive snubber and said primary winding to said second series inductive snubber; and

a reset branch coupled in parallel to said primary winding and including a reset resistance connected in series with a reset diode, said reset branch providing substantially near-critical damping of oscillations between said capacitive snubbers and said primary winding of said recovery transformer.

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## 4,611,268

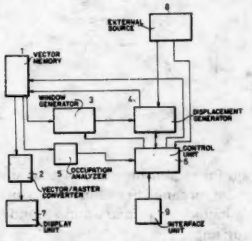
## METHOD AND ELECTRONIC APPARATUS FOR OPTIMAL ARRANGEMENT OF SHAPES HAVING AT LEAST TWO DIMENSIONS

**Sándor Götz, Berkenye u.20, H-1025 Budapest; Sándor Kreneditis, Ferenc krt. 15., H-1094 Budapest, and Ferenc Szatmári, Attila u.108., H-1191 Budapest, all of Hungary**

**Filed Jan. 6, 1984, Ser. No. 568,570**

**Int. Cl.[4] G06F** *15/46, 3/153*

**U.S. Cl. 364—148** **12 Claims**




1. A method of optimal arrangement of multidimensional shapes within a predetermined space, comprising the following steps:

(i) storing data, in vectorial form, of shapes already arranged;

(ii) providing data, in vectorial form, of shapes to be arranged;

(iii) generating one of a predetermined number of positions of one of said shapes to be arranged within said predetermined space with respect to said shapes already arranged;

(iv) repeating said step (iii) in accordance with a comparison of row-column resolutions of said shapes already arranged with said one of said shapes to be arranged, a scalar value being assigned to each outcome of said step (iii) in accordance with a predetermined algorithm;

(v) storing, in vectorial form, a position of said one of said shapes to be arranged, in accordance with scalar values generated in said steps (iii)–(iv), whereby said one of shapes to be arranged becomes one of said shapes already arranged; and

(vi) repeating said steps (i)–(v) until an insufficient amount of said space remains to arrange any more shapes.

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## 4,611,269

## APPARATUS AND METHOD IN WHICH A PLURALITY OF DETECTORS GENERATING SIGNALS WITH DIFFERENT PERIODS ARE USED TO DETECT THE ABSOLUTE POSITION OF A MOVING MEMBER

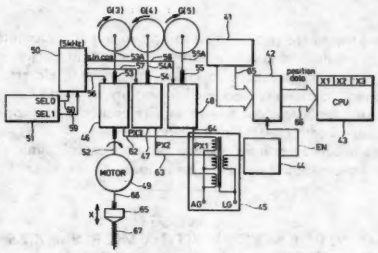
**Kimio Suzuki, Numazu; Jitsuo Toda, Koganei, and Wataru Shimizu, Fuchu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 15, 1983, Ser. No. 552,365**

**Claims priority, application Japan, Nov. 15, 1982, 57-199882**

**Int. Cl.[4] G05B** *11/32, 19/29*

**U.S. Cl. 364—174** **27 Claims**




17. A process for detecting an absolute position of a moving member using a plurality of detectors generating signals with different periods, comprising the steps of:

preparing a detecting means having a plurality of detectors which generate periodical electric signals corresponding to predetermined mechanical movements of said member, the periods of the electrical signals obtained from each of said detectors being different from each other;

generating said mechanical movement between said detecting means and said member;

digitally storing in memory means said electric signals corresponding to the respective periods of each detector;

specifying a relative position representing said mechanical movement between one of the detectors and said member by summing a first value, representing the multiplication of an integer N by a first period corresponding to the electrical signals obtained from said one of said detector, and a second value corresponding to the electrical signals obtained from said one of said detectors and which is less than said first period and is stored in said memory means; and

determining said integer N by using a second period corresponding to the electrical signals obtained from another detector of said detecting means and a third value corresponding to the electrical signals from said another detector, which third value is less than said second period and is stored in said memory means.

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## 4,611,270

## METHOD AND MEANS OF CONTROLLING THE OUTPUT OF A PULSED LASER

**Gary K. Klauminzer; S. Spencer Merz, both of Lexington, and James D. Campbell, Bedford, all of Mass., assignors to Questek Incorporated, Billerica, Mass.**

**Filed Sep. 16, 1983, Ser. No. 532,786**

**Int. Cl.[4] H01S** *3/13*

**U.S. Cl. 364—183** **20 Claims**

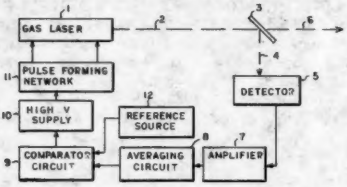
1. A feedback loop control system for controlling energization of a pulsed laser so that desired laser output radiation

pulses of substantially constant energy are produced over the relatively long-term operation of the laser comprising,

(a) a pulsed laser,

(b) means for periodically energizing said laser so that said laser emits a pulse of radiation following each periodic energization,

(c) means for detecting said laser pulses, and producing corresponding electric signals, each of which is representative of the energy of its corresponding laser pulse,




(d) means for producing a reference signal representative of said desired constant energy laser output pulses,

(e) means responsive to said corresponding electric signals and said reference signal for comparing said corresponding electric signals with said reference signal, producing an output control signal, and

(f) means responsive to said output control signal for controlling said laser energizing means.

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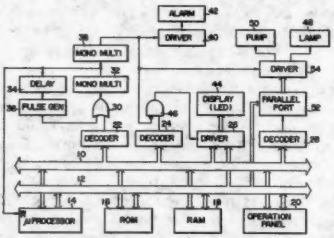
**4,611,271**

## CONTROL SYSTEM WITH A MICROPROCESSOR

**Shinichiro Hattori; Seiichi Hosoda; Masahide Kanno, and Atsushi Amano, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed May 9, 1984, Ser. No. 608,436**
**Claims priority, application Japan, May 20, 1983, 58-88809**
**Int. Cl.⁴ G06F *11/00***
**U.S. Cl. 364—184** **5 Claims**




1. A control system with a microprocessor, comprising:

decoder means (22) coupled to the microprocessor for periodically generating a signal when the microprocessor is operating in a normal state;

OR gate means (30) having first and second input terminals, the signal from said decoder means (22) being supplied to the first input terminal;

first multivibrator means (32) with a first time constant for supplying a first output signal in response to an output signal from the OR gate means (30), said first output signal being supplied to the microprocessor as a reset signal;

delay means (34) for delaying the first output signal from the first multivibrator means (32);

trigger signal generating means (36) coupled to receive an output signal from the delay means (34) and for supplying the trigger signal to the second input terminal of said OR gate means (30);

second multivibrator means (38) with a second time constant which is longer than the first time constant for receiving the first output signal from said first multivibrator means (32) and for outputting in response thereto an abnormal detection signal;

means (54) for controlling an object device (48, 50) in response to the output signal of the microprocessor and for placing the object device (48, 50) in a specific operational condition in response to the abnormal detection signal;

first means (44) coupled to the microprocessor for indicating an operational state of the object device (48, 50), the first means also being coupled to said second multivibrator means and being set in a specific operational state in response to the abnormal detection signal; and

second means (42) coupled to the second multivibrator means for indicating an abnormal operation of the microprocessor in response to the abnormal detection signal.

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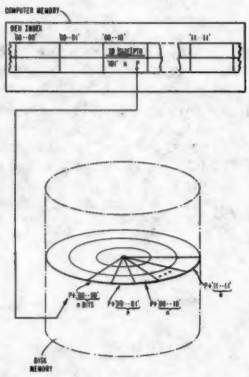
**4,611,272**

## KEY-ACCESSED FILE ORGANIZATION

**David B. Lomet, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 3, 1983, Ser. No. 463,469**
**Int. Cl.⁴ G06F *12/02***
**U.S. Cl. 364—200** **12 Claims**




1. A method for establishing and maintaining a key-accessed file management organization and procedure in a computer system which includes a primary and secondary memory, said method comprising:

providing a data level including a set of blocks of pages stored in the secondary memory;

providing an index level stored in the primary memory when the file is in use;

said index level including a set of index entries, each of which includes a starting address indicating the location on the secondary memory where a block of contiguous pages begins; and

a size field indicating the number of pages in said block of pages having said starting address;

said method further comprising maintaining the file by:

changing the number of pages in said blocks as the size of the file changes,

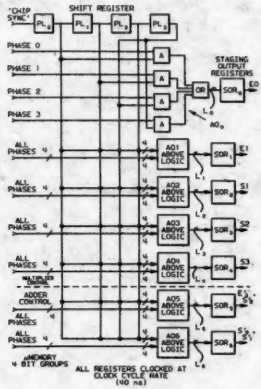
specifying said size in the size field as the logarithm, base two, of the number of pages referenced by said index entry, and

changing the size field in any index entry in which the number of pages in the referenced block is changed.

## 4,611,273
## SYNCHRONIZED MICROSEQUENCER FOR A MICROPROCESSOR

**Anthony E. Pione, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 30, 1983, Ser. No. 567,035**
**Int. Cl.[4] G06F** *9/22, 9/26, 7/00*
**U.S. Cl. 364—200** **12 Claims**




1. A high speed microinstruction sequencer for sequentially generating a plurality of N control words during a period, each control word having a plurality of M bits, comprising:

an N bit shift register having N sequential outputs and a clock input with a cycle time equal to 1/N of said period, for propagating a binary bit therethrough to sequentially provide an enabling bit to each of said respective N outputs thereof;

a plurality of M logic stages, each said stage including a plurality of N AND gates, and each of said AND gates having a first and second input, an $i^{th}$ one of said N AND gates in each said stage having a first input connected to an $i^{th}$ one of said N outputs of said shift register;

a control storage means having a plurality of storage locations containing at least said N control words, having a plurality of M times N output lines respectively connected to said second input of each of said AND gates in said M logic stages;

whereby each of said M bit control words can be sequentially output during said period.

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## 4,611,274
## DATA TRANSMISSION SYSTEM VIA POWER SUPPLY LINE

**Katsuyuki Machino, Nara; Masahiro Ise, Kashihara, and Hidehiko Tanaka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 29, 1983, Ser. No. 518,450**
**Claims priority, application Japan, Jul. 30, 1982, 57-133932**
**Int. Cl.[4] G06F** *13/38;* **H04J** *3/02, 3/16;* **H04Q** *9/00*
**U.S. Cl. 364—200** **2 Claims**

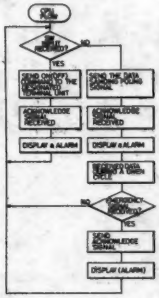
1. A data transmission system including a central processing unit for surveilling a plurality of terminal units, said central processing unit being connected to each terminal unit via a power supply line therefore, means for synchronously mixing a high frequency AC signal into the AC commercial frequency on the power supply line so that data transmission may be performed along said line and the normal and emergency conditions of each terminal unit may be surveilled, the improvement comprising:

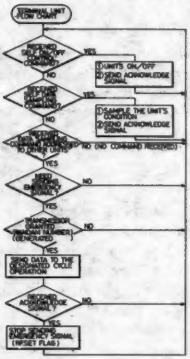
means within said central processing unit for selectively sending polling signals to each terminal unit to initiate transmission of normal condition data therefrom;

means within each terminal unit responsive to a specific polling signal for transmitting said normal condition data to said central processing unit at spaced intervals via said power supply line;

emergency data transmission means within each terminal unit for synchronously transmitting emergency data to the central processing unit via said power supply line during a specific AC commercial frequency cycle between said polling signals;

means in said central processing unit for sensing emergency data only during said specific AC commercial frequency






cycles and identifying only valid energency data associated with one of said terminal units and means in said central processing unit for transmitting an acknowledgement signal to said one of said terminal units only if valid emergency data is identified, the existence of valid emergency data occurring during said specific cycles only in the absence of a collision of emergency data from respective terminal units; and

means within each terminal unit for resending emergency signals at random times in response to the absence of receipt of said acknowledgement signal within a predetermined time following the transmission of emergency data;

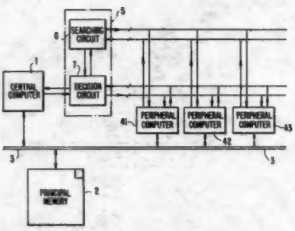
whereby the terminal units may be surveilled by a combination of polling and contention techniques.

4,611,275

## TIME SHARING DEVICE FOR ACCESS TO A MAIN MEMORY THROUGH TO A SINGLE BUS CONNECTED BETWEEN A CENTRAL COMPUTER AND A PLURALITY OF PERIPHERAL COMPUTERS

Jean-Francois Garnier, Rueil-Malmaison, France, assignor to Jeumont-Schneider, France

Continuation-in-part of Ser. No. 247,293, Mar. 26, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,813
Claims priority, application France, Jul. 30, 1979, 79 19505
Int. Cl.[4] G06F *13/14, 13/36*
U.S. Cl. 364—200 2 Claims




1. A time sharing device in a system having a principal memory connected to a single bus, said single bus also being connected to a central computer and a plurality of peripheral computers and in which the central computer is normally occupying said bus to communicate through said bus to said memory, said time sharing device comprising:

searching circuit means connected to said peripheral computers in a bidirectional manner for cyclically accessing said peripheral computers in a predetermined order and receiving requests to use said single bus from an accessed computer, and for identifying the peripheral computer making a request;

decision circuit means connected to said searching circuit means and connected in a bidirectional manner to said central computer and said peripheral computers for receiving information from said central computer and said peripheral computers concerning the state of occupancy of said single bus and granting authorization to the peripheral computer making a request only when said single bus is free and use of the single bus is not required by the central computer; and

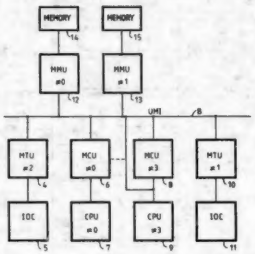
wherein said searching circuit includes a cyclic counter, a multiplexer and a flip-flop, said multiplexer being controlled by said cyclic counter the cycle whereof depends on the number of the said peripheral computers being connected to said bus, said cyclic counter having an address output connected to said peripheral computers, said multiplexer having inputs connected, respectively, to said peripheral computers, an output connected to a set input of said flip-flop, said flip-flop being connected to said cyclic counter so that said cyclic counter is inhibited on the output connected to the peripheral computer having requested to use said bus, said flip-flop also being connected to an input of said decision circuit for transmitting a signal to said decision circuit indicating that a request is being received, an output of said decision circuit being connected with a reset input of said flip-flop so as to return the said flip-flop to its initial state, and to a control input of said cyclic counter in order to return said cyclic counter to service when authorization to use said bus has been granted by said decision circuit.

4,611,276

## DEVICE FOR SUPERIMPOSITION OF THE SUCCESSIVE STAGES OF THE TRANSFER OF DATA AMONG SEVERAL DATA PROCESSING UNITS

Daniel R. Vinot, Sucy en Brie, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, France

Continuation of Ser. No. 210,359, Nov. 25, 1980, abandoned. This application Mar. 20, 1984, Ser. No. 591,237
Claims priority, application France, Jan. 21, 1980, 80 01213
Int. Cl.[4] G06F *13/36*
U.S. Cl. 364—200 4 Claims




1. A system for superposing successive phase of data transfer on a transmission bus having data, address and control sections common to a plurality of data processing units, each said unit including a control logic circuit, comprising:

a programmed control means;

means responsive to said control means for establishing a multiple cycle operating phase of said unit;

means for storing data to be transmitted on the data section of the bus to another one of said units or to be received from said another one of said units and for storing an address of said another one of said units;

means responsive to said control means for applying to the bus a unit status signal indicating any utilization of the bus by said unit itself;

means responsive to the control means for generating a local request signal requesting access to the bus during a current operating phase of the unit;

first monitoring means monitoring said bus and responsive to the control means for generating a bus occupation signal to determine whether the bus currently is in utilization by another one of said units;

said control means including second monitoring means monitoring said bus for generating a status signal depending upon bus status defining utilization of the bus by said unit for subsequent cycles of the same operating phase of the unit itself;

priority means monitoring said bus and said local request signal for measuring priorities of the local request signal and request signals on the bus generated respectively by other ones of said units, and in response for generating a priority local request signal if the priority of the local request signal is determined to be the highest;

first cycle generator means controlled by said multiple cycle operating phase establishing means responsive to a priority local request signal and said second monitoring means for controlling said unit to transmit data stored in said storage means to said another one of the units on the bus; and

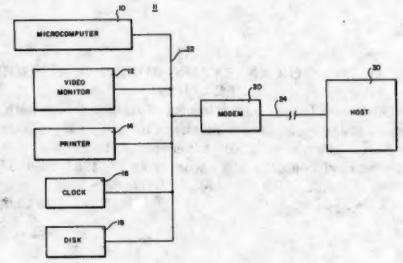
second cycle generator means controlled by said multiple cycle operating phase establishing means and responsive to said priority local request signal for controlling said unit to receive data from said another one of said units on the bus.

4,611,277

## MICROCOMPUTER COMMUNICATIONS SOFTWARE

John C. Kemppainen, Benicia, and Thomas E. Trelford, Corte Madera, both of Calif., assignors to BankAmerica Corporation, San Francisco, Calif.

Filed Sep. 15, 1983, Ser. No. 533,064
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 9 Claims




1. A communications system comprising
a user terminal including
a microcomputer,
a mainframe computer connected to said microcomputer, said user terminal further including communication software control means for controlling the transfer of data directly between said microcomputer and said mainframe computer, said software control means including means for controlling the transfer of said data in an unattended mode.

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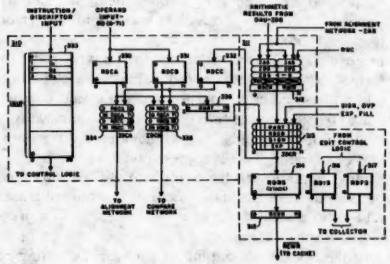
4,611,278

## WRAPAROUND BUFFER FOR REPETITIVE DECIMAL NUMERIC OPERATIONS

Donald C. Boothroyd, Phoenix; John E. Wilhite, and Robert W. Norman, Jr., both of Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 1, 1983, Ser. No. 481,228
Int. Cl.[4] G06F *9/34*
U.S. Cl. 364—200 2 Claims



1. In a data processing system, having a main storage element for storing programs and data utilized by a central processing unit (CPU) of said data processing system, said CPU executing the programs stored in the main storage element, said CPU being operatively connected to said main storage element, and wherein the CPU includes a central unit, a cache unit, and a plurality of execution units, the cache unit storing instructions and operands currently awaiting execution, the cache unit being operatively connected to the main storage element, and the central unit performing predetermined initial operations on the instructions, the initial operations including fetching instructions from said cache unit, decoding the instructions, preparing the virtual address, paging and fetching the operand associated with the instruction, and transferring the instruction to a predetermined one of the execution units, each execution unit performing the execution of a predetermined class of instruction, each execution unit being operatively connected to said cache unit for receiving operands and to said central unit for receiving predetermined instructions processed by said central unit, wherein at least one execution unit includes a first stage, operatively connected to said central unit and to said cache unit for temporarily storing input data, said input data being predetermined instructions including operation commands from said central unit and the operand being received from said cache unit, and a second stage, having two inputs for receiving two operands, operatively connected to said first stage for executing the predetermined instruction, and wherein the first stage includes a first input buffer for temporarily storing at least one predetermined instruction, and a second input buffer for temporarily storing the operand associated with said temporarily stored predetermined instruction to distribute said temporarily stored operand to the second stage, said second input buffer comprising:

(a) first storage means, operatively connected to said cache unit, for temporarily holding said operand;

(b) second storage means, operatively connected to an output of said second stage, for temporarily holding result data from the completed execution of the instruction by said second stage;

(c) control logic means, operatively connected to said first input buffer, for generating select control signals; and

(d) switch means, operatively connected to said first storage means and to said second storage means, and further operatively connected to said second stage, for selectively coupling the operand stored in said first storage means or the result data stored in said second storage means to said second stage to be utilized in the execution of the next sequential instruction from the completed instruction which yielded the result data, in response to said select control signals.

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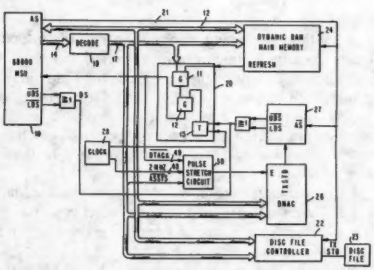
4,611,279

## DMA ASYNCHRONOUS MODE CLOCK STRETCH

Mark E. Andresen, Norwalk; Thomas A. Kriz, Sandy Hook, and Andrew S. Potemski, New Milford, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1983, Ser. No. 485,085
Int. Cl.[4] G06F *13/00, 1/00*
U.S. Cl. 364—200 4 Claims




1. In a microprocessor controlled data processing system including a bus for data, address and control signals, a system clock, an asynchronous microprocessor which generates a valid data control signal to indicate that valid data is on the bus and responds to a data transfer acknowledgment signal to regulate the length of a data transfer, a dynamic random access memory which provides a refresh signal while data is being refreshed in the memory, and I/O device running asynchro-

nously of the memory, and direct memory access control means for bypassing the microprocessor in the transferring of data between the memory and the I/O device during a repetitively recurring fixed length transfer window signal generated by said direct memory access control means from a cyclical timing signal of the system clock, the improvement comprising:

data transfer acknowledgment means having gate means responsive to said refresh signal, said transfer window signal and said valid data control signal for inhibiting the generation of a transfer acknowledgment signal while the memory is being refreshed or until valid data is available,

logic means responsive to the generation of said transfer acknowledgment signal for extending the length of said transfer window signal to permit completion of the data transfer when the occurrence of said refresh period or late availability of valid data prevents completion of a data transfer during a transfer window signal of normal length.

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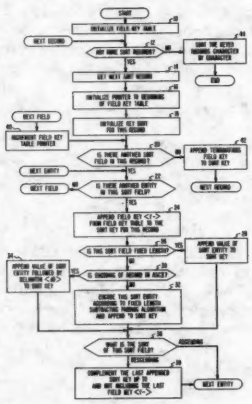
## 4,611,280
## SORTING METHOD

**John P. Linderman, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Mar. 12, 1984, Ser. No. 588,231**
**Int. Cl.[4] G06F *7/08***
**U.S. Cl. 364—300** **10 Claims**



1. A method of sorting information records in accordance with the contents of one or more specified sort fields for each record, in which any of the specified sort fields may contain any number of sort objects and in which sort objects may vary in length, the method comprising the steps of

A. assigning for each successive specified sort field a next one of a set of lexicographically ordered field keys,

B. generating a sort key for each record by

B1. initializing the sort key to a prescribed initial state,

B2. for a first sort field in the record containing at least one sort object, appending to the present sort key the assigned field key,

B3. appending to the present sort key a character string derived from a first sort object of the field, the resulting appendage from steps B2 and B3 having the characteristic that it is not a valid prefix of a character string derived from any other sort object in the corresponding sort field of another of the records,

B4. repeating steps B2 and B3 for each sort object of the first sort field, repeating steps B2, B3 and B4 for each successive specified sort field,

B5. appending to the present sort key a different terminating field key selected from the set of lexicographically ordered field keys, and

C. ordering the records according to a lexicographic comparison of their sort keys.

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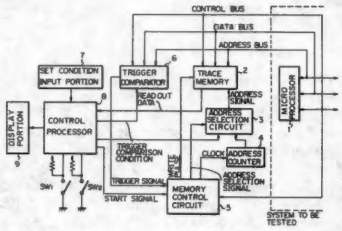
## 4,611,281
## APPARATUS FOR ANALYZING MICROPROCESSOR OPERATION

**Shouichi Suko, Tokyo, and Hirohisa Hoshino, Tama, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan**

**Filed May 18, 1984, Ser. No. 611,839**
**Claims priority, application Japan, May 24, 1983, 58-90073**
**Int. Cl.[4] G06F *11/00***
**U.S. Cl. 364—200** **3 Claims**




1. Apparatus for analyzing an operation of a microprocessor including:

a memory which stores various signals of said microprocessor in a system to be tested;

an address counter which specifies an address of said memory;

a setting condition input apparatus for inputting various setting conditions;

a trigger comparator for comparing said various signals of said microprocessor and a trigger condition set previously, and for generating a coincident pulse (a trigger signal) when said various signals and said trigger condition are coincident;

a memory control circuit for outputting a write pulse to said memory in response to a start signal and a clock pulse to said address counter, and for receiving said coninicident pulse (trigger signal) from said trigger comparator, so as to stop said write pulse to said memory and the output of said clock pulse to said address counter;

a display apparatus for displaying said various setting conditions input from said setting condition input apparatus and said various signals stored in said memory in a predetermined form;

a control processor for outputting said various setting conditions from said setting condition input apparatus to said trigger comparator and to said display apparatus, and for outputting an address of said memory, and for reading desired data from said memory so as to output said data to said display apparatus, and for outputting said start signal to said memory control circuit;

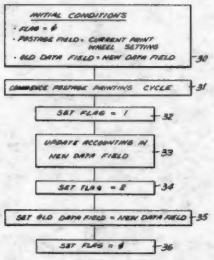
an address selection circuit for selecting an address to said memory from said control processor and an address to said memory from said address counter; and

data switches connected to the input of said control process or for instructing a commencement of a data search operation.

## 4,611,282
## POSTAGE METER USING A FLAG TO INDICATE INTERUPTION OF ACCOUNTING REGISTER UPDATING DUE TO POWER FAILURE OR MICROPROCESSOR FAILURE

**Robert B. McFiggans, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.**

**Filed Jul. 18, 1983, Ser. No. 514,412**
**Int. Cl.[4] G07B *17/02, 17/04***
**U.S. Cl. 364—406** **12 Claims**




1. In an electronic postage meter including an electronic accounting system having a memory arrangement, and a data input and printer coupled to the accounting system, the memory arrangement including an accounting memory arrangement for maintaining an accounting of printed postage and a program memory arrangement storing a program for controlling the printing of postage and accounting of postage printed; the improvement comprising means for storing data of the setting of said printer in a first portion of said accounting memory arrangement prior to the printing of postage under the control of said program, said accounting memory arrangement having a second memory portion for storing at least one flag, said accounting memory arrangement having third and fourth portions for storing accounting data, said program comprising means for sequentially updating accounting data in said third and fourth memory portions in response to the data stored in said first memory portion during said printing of postage while distinctively setting a flag in said second memory portion at a plurality of different times during said updating of accounting in said third and fourth memory portions, and power-up means responsive to the states of said flag for completing any accounting that had not been completed in a printing cycle prior to a loss of operating power.

9. A method for maintaining accounting of postage printed in an electronic meter having a postage input, a memory and a postage print; comprising continually storing data of the setting of said printer in a first portion of said memory, updating at least one accounting register in a plurality of steps by updating said register in a second portion of the memory while printing postage on said printer, on the basis of data stored in said first portion of memory, and subsequently updating said register in a third portion of said memory, while distinctively modifying a flag in said memory at each of the steps, whereby the flags distinctively indicate the stage of updating of accounting.

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## 4,611,283
## RADIOGRAPHIC IMAGING APPARATUS AND METHODS FOR OPERATING SUCH APPARATUS

**Leon Lumelsky, Stamford, and Jonathan S. Shapiro, Cos Cob, both of Conn., assignors to Raytheon Company, Lexington, Mass.**

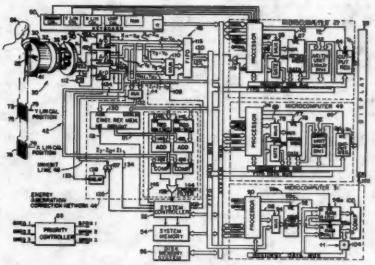
**Filed Dec. 30, 1981, Ser. No. 335,951**
**Int. Cl.[4] G06F *15/42*; G01T *1/20***
**U.S. Cl. 364—414** **8 Claims**

2. Radiographic imaging apparatus comprising:

(a) means for detecting the occurrence of radioactive event received over a field of view of the apparatus, such field of view being divided into an array of pixels, and for producing for each one of the detected events both: (i) a position signal representative of the one of the pixels which received such one of the detected events; and, (ii) an energy signal representative of the energy level of such one of the detected events;

(b) means responsive to the position signal and the energy signal produced in response to a plurality of radioactive events detected during a calibration mode for measuring the average energy level, $M_{Li}$ of the detected radioactive events received by each one of the pixels, $P_i$, during the calibration mode and the average energy level, $M_g$, of the detected radioactive events received by the array of detectors during the calibration mode;

(c) means, resposponsive to the position signal and the energy signal produced in response to the plurality of radioactive events during the calibration mode, for determining an energy correction term, $D_i$, for each one of the pixels,



$P_i$, representative of the difference between the average energy level, $M_{Li}$ of the radioactive events received by such one of the pixels, $P_i$, during the calibration mode and the average energy level, $M_g$;

(d) means for storing the energy correction term, $D_i$, for each one of the pixels, $P_i$;

(e) means, responsive to the position energy signal of a radioactive event detected subsequent to the calibration mode, for addressing the storing means and for reading therefrom the energy correction term, $D_i$, stored for the one of the pixels, $P_i$, which received such subsequent radioactive event; and,

(f) means, resposnive to the energy signal of such subsequent radioactive event, the read energy correction term, $D_i$, for the one of the pixels, $P_i$, which received such subsequent event, and to a predetermined energy range signal, W, for producing a control signal indicating whether the energy level of such subsequent event is within a range of energy levels between $M_g+W/2+D_i$ and $M_g-W/2+D_i$.

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## 4,611,284
## METHOD FOR DECOMPOSING AN ELECTROMYOGRAM INTO INDIVIDUAL MOTOR UNIT ACTION POTENTIALS

**Kevin C. McGill, Palo Alto, and Leslie J. Dorfman, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford, Jr. University, Palo Alto, Calif.**

**Filed Sep. 9, 1983, Ser. No. 531,209**
**Int. Cl.[4] G06F *15/42*; A61B *5/04***
**U.S. Cl. 364—417** **10 Claims**

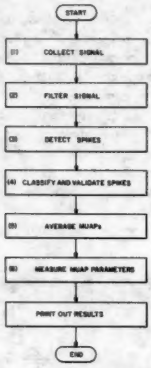
1. A method of decomposing an electromyogram for identifying and measuring individual motor-unit action potentials comprising the steps of

high-pass filtering and digitally sampling the electromyogram using a low-pass differentiator to obtain a filtered electromyogram,

establishing a spike-detection threshold,

detecting spikes in said filtered electromyogram that exceed the spike-detection threshold,

classifying the detected spikes into spike trains on the basis of similarity of spike waveshape by representing said spikes by their discrete Fourier transforms,




identifying spike trains that correspond to individual motor units on the basis of the regularity of occurrence of the spikes in the train, and

extracting from the electromyogram the motor-unit action potentials of said spike trains.

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**4,611,285**

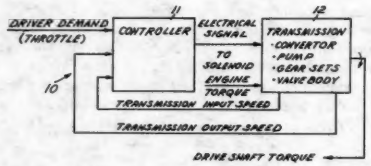
## METHOD OF CONTROLLING AUTOMATIC TRANSMISSION SHIFT PRESSURE

**S. Miller Weisman, II, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Apr. 5, 1984, Ser. No. 596,970**

**Int. Cl.[4] B60K *41/08***

**U.S. Cl. 364—424.1** **11 Claims**




1. A method of selecting a desired transmission gear ratio in a stepped ratio, electronically-controlled, hydraulic transmission, including the steps of:

(a) sensing a function of driver demand requesting power transfer by the hydraulic transmission;

(b) calculating a desired transmission gear ratio as a function of actual driver demand and actual vehicle speed;

(c) selecting, as a function of the desired transmission gear ratio, a first function of a stored predetermined ratio of desired transmission shift pressure to transmission input torque capacity pressure; and

(d) changing the actual transmission shift pressure so the ratio of the actual transmission shift pressure to the transmission input torque capacity pressure approaches the selected predetermined ratio.

**4,611,286**

## CASH ACCOUNTING SYSTEM

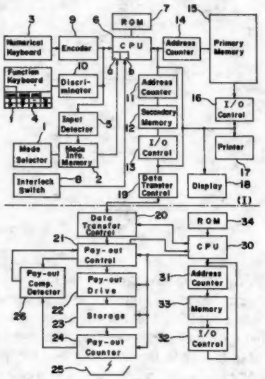
**Katsuji Nishimura, Habikino, and Hachizou Yamamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 460,298, Jan. 24, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,203**

**Claims priority, application Japan, Jan. 30, 1982, 57-14035; Feb. 10, 1982, 57-20323; Feb. 10, 1982, 57-20324**

**Int. Cl.[4] G06F *15/30***

**U.S. Cl. 364—405** **1 Claim**




1. A cash accounting system for enabling an operator to input information and receive information regarding monetary transactions, comprising:

a plurality of cash register means each including input means for facilitating operator input of information regarding cash payout transactions;

first memory means associated with each said cash register means for storing first data including the total amount of money available for payout and the amounts of respective denominations of said money;

a sole cash dispenser means coupled to said plurality of cash register means and including means responsive to said input means of each said cash register means for dispensing sums of money for each payout transaction in amounts and denominations specified by an operator via said input means;

second memory means associated with said cash dispenser means for storing second data related to the amount of money and the amounts of respective denominations stored in and dispensed by said dispenser means;

said input means of each cash dispenser means comprising means for inputting and transferring to said second memory means said second data relating to amounts of money and denominations stored in said cash dispenser means;

data transfer means associated with said first and second memory means for correlating said first data related to payout transactions with said second data relating to money dispensed during said transactions including means for subtracting said first data relating to payout transactions, including the respective denomination amounts of money paid out, from the respective denomination amounts of money stored in the second memory means of said cash dispenser means;

said input means including checking means for prompting a checking operation for said system to verify that the amount of money and respective denominations requested for payout by said input means coincides with the amount of money and respective denominations actually paid out; and

output means associated with said checking means and said

first and second memory means for outputting information relating to transactions by said cash register means, said checking operation and money dispensed by said cash dispenser means.

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**4,611,287**

## FUEL VOLUME MEASURING SYSTEM FOR AUTOMOTIVE VEHICLE

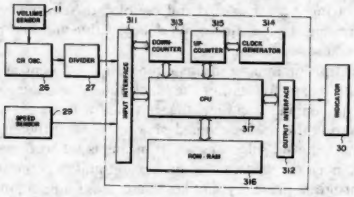
**Hiroshi Kobayashi, Yokohama, and Hiroaki Obayashi, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Jun. 8, 1983, Ser. No. 502,321**

**Claims priority, application Japan, Aug. 16, 1982, 57-141803; Aug. 16, 1982, 57-141805; Sep. 27, 1982, 57-166541**

**Int. Cl.[4] G01F *23/26, 9/02, 15/075;* G06F *15/20***

**U.S. Cl. 364—442** **46 Claims**




1. A fuel volume measuring system for an automotive vehicle provided with a fuel tank, which comprises:

fuel volume sensing means for repeatedly outputting a fuel volume detection signal $D_m$ corresponding to fuel volume within the fuel tank at regular time intervals;

first averaging means responsive to said fuel volume sensing means for averaging the fuel volume detection signal and outputting a first averaged fuel voulme data signal $A_m$;

second averaging means responsive to said first averaging means for further averaging the averaged fuel volume data signal $A_m$ and outputting a second averaged fuel volume data signal $B_m$;

fuel volume calculating means for calculating a fuel volume on the basis of an effective averaged fuel volume data signal and outputting a fuel volume data signal $Q_m$;

vehicle speed determining means for determining vehicle speed and causing either said first averaged fuel volume data signal $A_m$ or said second averaged fuel volume data signal $B_m$ to be provided as said effective averaged fuel volume data signal in response to said vehicle speed;

indicator means responsive to said fuel volume calculating means for indicating a fuel volume on the basis of the fuel volume data signal $Q_m$,

whereby the fuel volume data signal $Q_m$ is calulated by said first and second averaging means for suppression of fluctuations of the fuel volume indication.

42. A method of measuring fuel volume within a fuel tank for an automotive vehicle, which comprises the following steps of:

(a) detecting the fuel volume within the fuel tank repeatedly and outputting fuel volume detection signals corresponding thereto at regular time intervals;

(b) simply-averaging the fuel volume detection signals and outputting simply-averaged fuel volume data signal $A_m$;

(c) comparing the current simply-averaged fuel volume data signal $A_m$ with the preceding simply-averaged fuel volume data signal $A_{m-1}$;

(d) if the current simply-averaged fuel volume data signal $A_m$ is equal to or smaller than the preceding simply-averaged fuel volume data signal $A_{m-1}$, weight-averaging the simply-averaged fuel volume data signal $A_m$, outputting a weight-averaged fuel volume data signal $B_m$, and calculating the fuel volume data signal $Q_m$ on the basis of the calculated weight-averaged fuel volume data signal $B_m$;

(e) if the current simply-averaged fuel volume data signal $A_m$ is greater than the preceding simply-averaged fuel volume data signal $A_{m-1}$, calculating the fuel volume signal $Q_m$ on the basis of the calculated simply-averaged fuel volume data signal $A_m$; and

(f) indicating the fuel volume in accordance with the calculated fuel volume data signal $Q_m$,

whereby the fuel volume can be indicated on the basis of the weight-averaged fuel volume data signal $B_m$ when the fuel volume is decreasing, but on the basis of the simply-averaged fuel volume data signal $A_m$ when the fuel volume is increasing.

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**4,611,288**

## APPARATUS FOR TAKING ODONTOLOGICAL OR MEDICAL IMPRESSIONS

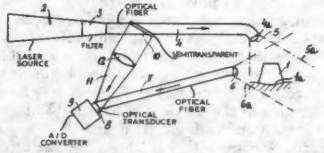
**Francois Duret; Elisabeth Duret nee Michallet, both of rue Paul Claudel, Le Grand Lemps, and Christian Thermoz, 2, place Victor Hugo, Grenoble, all of France**

**Filed Apr. 14, 1983, Ser. No. 485,059**

**Claims priority, application France, Apr. 14, 1982, 82 06707**

**Int. Cl.[4] G06F *15/46, 15/42;* A61C *13/00***

**U.S. Cl. 364—474** **5 Claims**




1. A system for taking an impression of a body region for the production of a prosthesis comprising:

at least one source of nontraumatic light wave energy for generating waves and directing same at a body region to be examined whereby said waves are reflected from said region;

at least one receiver for said waves reflected from said region for generating analog intensity values representing waves reflected from said region;

an analog-numerical converter connected to said receiver for transforming said analog intensity values representing the waves reflected from said region into numerical information representing characteristics of said region;

means receiving said numerical information for three-dimensional analysis of the shape and dimensions of said region from said numerical information and for designing a three-dimensional shape corresponding to a finished prosthesis with a contour adapted to fit said region; and

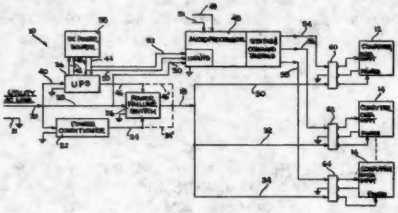
signal processing means connected to said means receiving said numerical information for transforming an output thereof into machine command signals for direct automatic control of a machine for the direct production of a prosthesis by machining of a workpiece to fit precisely to said region, said source being a source of coherent light, at least one optical fiber connected to said source of coherent light, and at least one lens associated with the optical fiber for directing coherent light onto said region, said receiver comprising a collecting lens, another optical fiber associated with said collecting lens, and a transducer connected to said other optical fiber for receiving reflected coherent light from said region, said system further comprising a reference optical path for bypassing a portion of light from said source directly to said receiver to serve as a reference enabling interference analysis of said region.

**4,611,289**

## COMPUTER POWER MANAGEMENT SYSTEM

**Anthony F. Coppola, 31811 E. Nine Dr., Laguna Niguel, Calif. 92677**

**Filed Sep. 29, 1983, Ser. No. 537,333**
**Int. Cl.[4] G06F *15/56*; G06B *15/02***
**U.S. Cl. 364—492** **4 Claims**



1. A power management system for providing power to a computer having provision for communication with an external data source, comprising:

a source of backup power;

means for providing utility power to the computer on a power bus;

means for providing the backup power source to the power bus when the utility power is interrupted;

processor means connected to the computer as an external data source and responsive to the state of the utility power for providing to the computer a first signal after the utility power is interrupted and a second signal after the utility power is restored, whereby the computer may respond to the first signal to prevent loss of data and to the second signal to restore normal operation; and

switch means responsive to a power cutoff signal from the processor means for removing backup power from the computer during an interruption of utility power; and in which the processor means includes means for receiving data from the computer and means for providing the power cutoff signal in response to a safety signal generated by the computer when data loss has been prevented by the computer.

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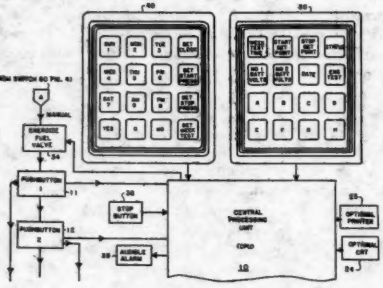
**4,611,290**

## COMPUTER CONTROLLED DIESEL ENGINE FIRE PUMP CONTROLLER

**Lee A. Henningsen, and Quentin J. Gardiner, both of Cary, N.C., assignors to Firetrol, Inc., Cary, N.C.**

**Filed Oct. 21, 1983, Ser. No. 544,443**
**Int. Cl.[4] G06F *15/72*; G05D *16/20*; F04B *49/06***
**U.S. Cl. 364—510** **16 Claims**



1. An automatic self contained internal combustion engine fire pump controller for testing and operating an internal combustion engine coupled to a water pump for maintaining water pressure in a sprinkler system, said sprinkler system including a deluge valve for reducing the water pressure, said engine having a starter motor and at least one starter solenoid connected to at least one battery, and a separate fuel supply, comprising:

a housing for containing the controller;

a selector switch means disposed in said housing and having at least a manual run position, and an automatic run position;

means for controlling the fuel flow from the fuel supply to the the internal combustion engine;

pressure transducer means for sensing the fluid pressure of said sprinkler system;

deluge valve means coupled to the water pressure of the sprinkler system for decreasing the water pressure therein;

central processing means responsive to the automatic position of said switch means and coupled to said means for controlling the fuel flow, said deluge valve and said pressure transducer means;

keyboard programming means coupled to said central processing means for setting the clock time, the engine start time, the engine stop time, the set time for the engine, and for setting the predetermined pressure to start the engine;

so that when said selector switch means is set to the automatic position, said central processing unit in response to the program preset by said keyboard programming means and at a preset test time, opens the deluge valve to cause a pressure drop in the sprinkler system fluid, and at a preset pressure drop sensed by said pressure transducer means, operates the starter solenoid to connect the battery to the starter motor to automatically start the engine, maintain the engine running for a preset time interval, and then operate said fuel control means to cut off the fuel to shut down the engine.

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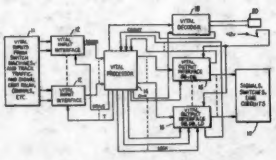
**4,611,291**

## VITAL INTERFACE SYSTEM FOR RAILWAY SIGNALLING

**James R. Hoelscher, Rochester, N.Y., assignor to General Signal Corp., Rochester, N.Y.**

**Filed Nov. 10, 1983, Ser. No. 550,430**
**Int. Cl.[4] B61L *27/00*; G08B *21/00*; G01R *19/15***
**U.S. Cl. 364—550** **27 Claims**



1. Interface system for inputs to and outputs from a vital processor of railway signals which comprises vital input interface means connected to and operable under control of the vital processor for translating inputs from sources of railway signals into a plurality of serial digital signals, the format of each of which represents a fault in said input interface means itself, a plurality of output interface means connected to and operated by said vital processor for controlling the operation of railway signal and control devices, and means in said output interface means operated by said vital processor for repeatedly checking the validity of operation of said output interface means.

## 4,611,292
## ROBOT VISION SYSTEM

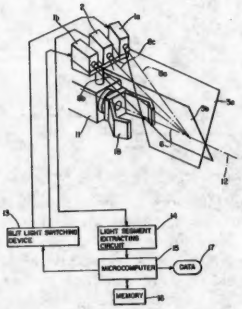
**Takanori Ninomiya, Yokohama, and Yasuo Nakagawa, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 29, 1983, Ser. No. 537,095**

**Claims priority, application Japan, Oct. 6, 1982, 57-174522; Nov. 12, 1982, 57-197473; Nov. 19, 1982, 57-201931**

**Int. Cl.[4] G01B** *11/24, 11/03, 11/22*

**U.S. Cl. 364—559** **32 Claims**




**14.** An apparatus for detecting the position and posture of an object, comprising:

a first light source having a first optical axis, to project a first planar light beam coplanar with the first optical axis toward an object;

a second light source having a second optical axis, to project toward said object a second planar light beam coplanar with the second optical axis, with the planes of said first and second light beams intersecting along a first line, said first line being pointed toward the object;

an image pickup device positioned between the planes of said light beams to form in a two dimensional coordinate system images of intersection lines projected upon said object by said light beams;

means for alternately energizing said first and second light sources;

a light segment extracting circuit coupled to said pickup device to scan said images and detect scanning coordinates of edges of said object along the intersection lines;

a memory device to store corresponding relationships between said two dimensional coordinate system and a three dimensional actual coordinate system; and

a computing device using the corresponding relationships to determine from said scanning coordinates actual coordinates of said edges in said three dimsnsional coordinate system and thereby provide an indication of the position and posture of said object in said three dimensional coordinate system.

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## 4,611,293
## METHOD AND APPARATUS FOR AUTOMATIC CALIBRATION OF MAGNETIC COMPASS

**Ronald R. Hatch, Wilmington, and Richard G. Keegan, Torrance, both of Calif., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.**

**Filed Nov. 28, 1983, Ser. No. 555,885**

**Int. Cl.[4] G01C** *17/38;* **G06F** *15/31*

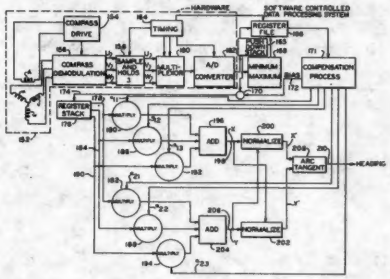
**U.S. Cl. 364—571** **24 Claims**

**1.** Apparatus for calibrating the distortions in the readings of a magnetic compass having a plurality of windings in a two dimensional plane and mounted in a vehicle comprising:

first means coupled to the compass windings for obtaining the outputs from each of the windings as a function of time by weighting and combining the outputs from each of the windings at a first time and for a predetermined number of the next previous times to said first time to obtain a time filtered output for each of the windings;

second means coupled to said first means for receiving the time filtered outputs and for obtaining maximum and minimum filtered outputs for each of the windings as the vehicle is turned through a circle of 360°;

third means coupled to said second means for computing biases from the maximum and minimum filtered outputs equal to the average of the maximum and minimum filtered outputs from each winding;




fourth means coupled to said third means for applying said biases to said maximum and minimum outputs to obtain a series of calibration parameters;

fifth means coupled to said first means and said fourth means for applying said parameters to said time filtered outputs to convert said time filtered outputs from said first means to two winding outputs, said two windings being orthogonally related to one another;

sixth means for obtaining the calibrated compass heading from said two winding outputs.

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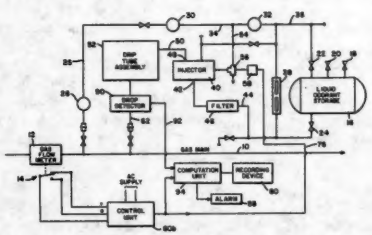
## 4,611,294
## METHOD OF AND APPARATUS FOR MONITORING ODORIZER PERFORMANCE

**Ira C. Stanfill, 4732 Kenmar Cove, Memphis, Tenn. 38128**

**Filed May 1, 1984, Ser. No. 605,851**

**Int. Cl.[4] G05D** *11/13*

**U.S. Cl. 364—173** **16 Claims**




**1.** A method of monitoring the addition of an additive fluid that is to be added to a flowing main fluid stream, said method comprising:

(a) selecting a base measurement parameter defining a monitor interval;

(b) selecting a predetermined desired ratio of additive fluid flow volume to main fluid flow volume;

(c) determining the volume of main fluid flow during said monitoring interval;

(d) introducing a quantity of an additive fluid to the main fluid stream in the form of drops during said monitoring interval;

(e) calculating the time averaged ratio of additive fluid volume to main fluid volume during the monitoring interval; and

(f) recording the ratio of volume of the additive fluid stream to the volume of the main fluid stream, and the time that the ratio calculation is made.

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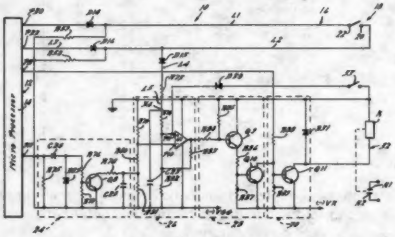
**4,611,295**

## SUPERVISORY CONTROL SYSTEM FOR MICROPROCESSOR BASED APPLIANCE CONTROLS

**Daniel L. Fowler, Kentwood, Mich., assignor to Robertshaw Controls Company, Richmond, Va.**

**Continuation of Ser. No. 382,970, May 28, 1982, abandoned.**
**This application Jun. 28, 1985, Ser. No. 750,066**
**Int. Cl.[4] G05B *9/02***
**U.S. Cl. 364—184** **18 Claims**



1. A power relay for operating an appliance in combination with a supervisory control system for providing control, supervision and safety shutdown of the output of said power relay, said supervisory control system comprising in combination:

a. a microprocessor including an input terminal and a pair of output terminals conditioned to generate control signals at said output terminals upon receipt of a signal at said input terminal;

b. manually or force actuated start switch means connected to a source of potential and to said input terminals;

c. electronic latch and missing pulse detector means including a comparator connected to both said switch means and one of said output terminal;

d. inhibit means connected to said electronic latch and missing pulse detector means and controlling energization of said power relay; and

e. relay driver means connected to said power relay and the other of said output terminals to control energization of said power relay;

wherein when said switch means is closed, control signals emitted from said microprocessor are AC coupled through said electronic latch and missing pulse detector means, said inhibit means, and said relay driver means to control the output of said power relay.

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**4,611,296**

## MANIPULATION DEVICE SUCH AS AN INDUSTRIAL ROBOT HAVING AT LEAST ONE SENSOR

**Erich Niedermayr, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 12, 1984, Ser. No. 660,382**
**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340946**
**Int. Cl.[4] G06F *15/46***
**U.S. Cl. 364—513** **17 Claims**

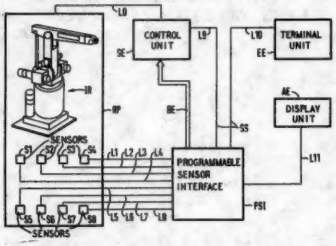
1. A manipulation device comprising:

a robot means;

a control unit connected to said robot means for controlling the operation thereof;

at least one sensor located on said robot means for detecting a parameter usable in controlling operation of said robot means, said sensor emitting an output signal within a sensor range;

a programmable sensor interface interconnected between said sensor and said control unit, said programmable sensor interface including at least one microprocessor and at least one programmable memory connected to said micro-




processor, said memory having a plurality of thresholds stored therein allocated to said sensor dividing said sensor range into at least three sub-ranges, and said microprocessor classifying an output signal received from said sensor into one of said sub-ranges and transmitting the result of said classification to said control unit for use in controlling the operation of said robot means.

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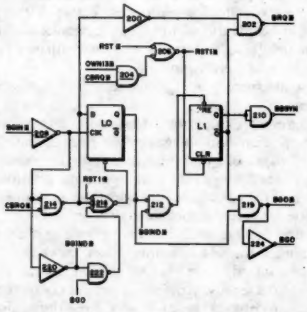
**4,611,297**

## BUS GRANT CIRCUIT

**Catherine M. Dudley, and Thomas A. Remedios, both of San Jose, Calif., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Aug. 18, 1983, Ser. No. 524,270**
**Int. Cl.[4] G06F *13/14***
**U.S. Cl. 364—900** **19 Claims**



8. A digital circuit for use in a bus arbitration system for granting control of a digital communications bus to one of a plurality of digital devices connected to said bus, one of said devices being connected to said digital circuit, of the type wherein a bus grant signal is propagated sequentially through said digital devices so that each of said digital devices not requesting control of said bus passes on said bus grant signal to the next of said digital devices and so that the first of said digital devices requesting control of said bus to receive said bus grant assumes control of said bus and does not pass on said bus grant signal, said circuit comprising:

(a) a first flip-flop circuit responding to an internal bus request signal asyncronously generated by the one of said digital devices connected to said circuit and to the input of said bus grant signal to set on the leading edge of the assertion of said bus grant signal input if and only if said internal bus request signal is not asserted, said set state of

said first flip-flop circuit enabling said digital device to pass along said bus grant signal, and said first flip-flop circuit responding to the trailing edge of the assertion of said bus grant signal to reset said flip-flop circuit; and,

(b) a second flip-flop circuit responding to said request signal, said bus grant signal and to the state of said first flip-flop circuit to set said second flip-flop circuit if and only if said bus request signal is asserted, said bus grant signal input is received and said first flip-flop is not set, said set state of said second flip-flop circuit enabling said connected digital device to assert a bus busy signal and assume control of said bus, and said second flip-flop responding to a signal from said connected device to reset when said connected device to pass on said bus grant signal or to assert said bus busy signal without inadvertent erroneous simultaneous assertion of said bus busy signal and said bus grant signal output by said connected digital device.

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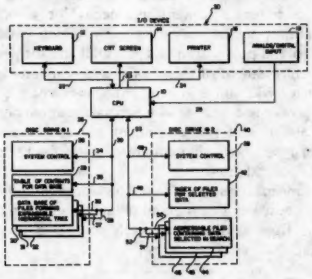
**4,611,298**

## INFORMATION STORAGE AND RETRIEVAL SYSTEM AND METHOD

**Marlo E. Schuldt, Orem, Utah, assignor to Harding and Harris Behavioral Research, Inc., Pleasant Grove, Utah**

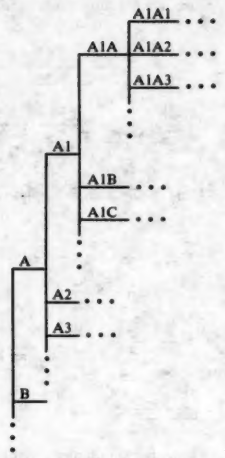
**Filed Jun. 3, 1983, Ser. No. 501,011**
**Int. Cl.[4] G06F *15/40***
**U.S. Cl. 364—900** **11 Claims**




1. In a computer system having a CPU, input/output apparatus electronically coupled to said CPU, and a storage means electronically coupled to said CPU, a method of information storage and retrieval comprising the steps of:

(a) logically classifying a plurality of data files and arranging said data files in the form of a hierarchal information tree having a plurality of mutually exclusive branches corresponding to the data files classified at various levels in the hierarchal structure of said tree;

(b) assigning a unique alphanumeric address to each said mutually exclusive branch of said hierarchal information tree, each said address identifying a data file so as to link said data files together to form an expandable hierarchal tree in which the data files corresponding to each mutually exclusive branch are generally addressed as follows:




(c) storing said logically classified data files on said storage means;

(d) initializing said CPU at said input/output apparatus;

(e) said CPU retrieving from said storage means the data file corresponding to the first branch of the first level in the hierarchal structure of said tree;

(f) said CPU thereafter selecting another data file from the information contained in the data file retrieved by said CPU in step (e);

(g) said CPU translating said selection into the unique alphanumeric address of the corresponding branch in the next level of said tree;

(h) said CPU retrieving from said storage means the data file identified by the unique alphanumeric address identified in step (g); and

(i) said CPU outputting at said input/output apparatus at least a portion of the information contained in said data file retrieved in step (h).

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**4,611,299**

## MONOLITHIC STORAGE DEVICE

**Ryoichi Hori, Tokyo, and Kiyoo Ito, Higashikurume, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 351,225, Feb. 22, 1982, abandoned.**
**This application Dec. 22, 1983, Ser. No. 564,497**
**Int. Cl.[4] G11C *13/00***
**U.S. Cl. 365—189** **26 Claims**

1. A memory, comprising:

a memory matrix comprised of a plurality of groups of memory cells, each group further comprised of plural subgroups;

a plurality of I/O lines, each corresponding to one of the groups;

a plurality of detectors, each corresponding to predetermined I/O lines;

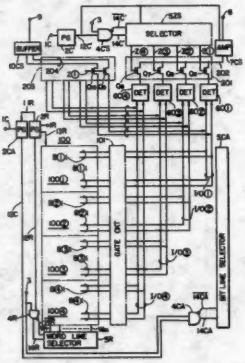
a plurality of latch means, each corresponding to predetermined detectors;

a plurality of first switching means, each corresponding to predetermined latch means, each of said first switching means being disposed between a corresponding detector and a corresponding latch means;

an output node means for outputting a signal provided on said I/O lines from said memory cells;

a plurality of second switching means, each corresponding to predetermined latch means, each of said second switching means being disposed between a corresponding latch means and said output node means;

first address means for simultaneously addressing a plurality of said subgroups, each addressed subgroup belonging to a different one of the groups; and



second address means for simultaneously connecting a corresponding one of memory cells of each of the subgroups addressed by said first address means to a corresponding I/O line.

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**4,611,300**

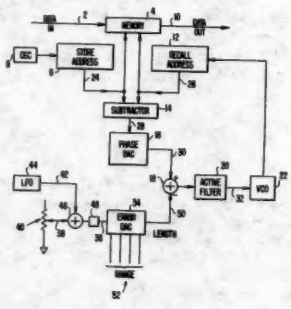
**DIGITAL DELAY LINE**

**Wilson E. Taylor, Jr., and Larry E. Hand, both of Meridian, Miss., assignors to Peavey Electronics Corp., Meridian, Miss.**

**Filed Aug. 21, 1984, Ser. No. 643,316**

**Int. Cl.[4] G11C *7/00***

**U.S. Cl. 365—194** **13 Claims**



1. A delay circuit comprising

digital memory means having an input for receiving input digital signals and an output for producing output digital signals;

store address means for causing said input digital signals to be stored at a plurality of locations in said memory means;

recall address means for causing said memory means to recall data from selected ones of said plurality of locations to produce said output digital signals;

a phase-locked loop for controlling said recall address means, said phase-locked loop comprising subtractor means for producing a difference signal representative of the difference between the locations in which said input signal is stored and from which said output signal is recalled, phase converter means for converting said difference signal into a first control signal, phase input means for producing a second control signal, and oscillator means controlled by said first and second control signals, said oscillator means producing an output for controlling the rate at which said recall address means recalls data from said memory means.

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**4,611,301**

**READ ONLY MEMORY**

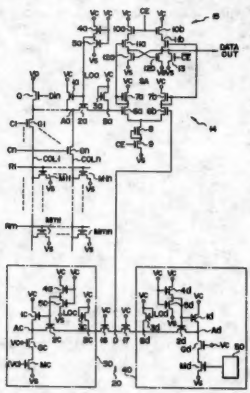
**Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Hidenobu Minagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan**

**Filed Apr. 6, 1984, Ser. No. 597,351**

**Claims priority, application Japan, Apr. 7, 1983, 58-61393; Feb. 21, 1984, 59-30757**

**Int. Cl.[4] G11C *7/02***

**U.S. Cl. 365—207** **12 Claims**



1. A read only only memory coupled to a power source comprising:

memory cells consisting of memory devices for storing data;

comparison potential generating means for generating a comparison potential having a value which varies in response to said power source's potential and for generating a different gradient of change for said comparison potential when said comparison potential is below a predetermined power potential than when said comparison potential is above said predetermined power potential, said predetermined power potential being less than said power source's potential; and

data sense means for sensing said data stored in said memory cells by comparing a potential obtained when reading out the data from said memory cells with said comparison potential.

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**4,611,302**

**NON-VOLATILE DATA STORES**

**Charles P. Bockett-Pugh, Surrey, England, assignor to Schlumberger Electronics (U.K.) Limited, Farnborough, England**

**Filed Jun. 29, 1984, Ser. No. 626,261**

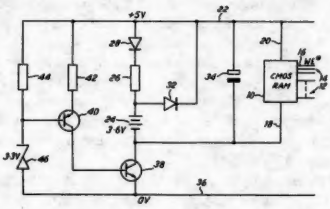
**Claims priority, application United Kingdom, Jun. 30, 1983, 8317747**

**Int. Cl.[4] G11C *7/00***

**U.S. Cl. 365—229** **5 Claims**

1. A non-volatile data store, comprising volatile data storage means, power terminals for receiving power from a power source, and a battery for maintaining energisation of the storage means upon interruption of power from the power source, the storage means having a control terminal for receiving a control signal of predetermined polarity for enabling data transfer with the storage means in response to said control signal, wherein a power input of the storage means and a

power output of the battery, each having said predetermined polarity, are selectively connectable to the corresponding one




of the power terminals, and are arranged to be disconnected therefrom upon interruption of power from the power source.

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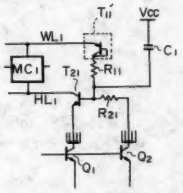
**4,611,303**

## WORD-LINE DISCHARGING CIRCUIT IN A STATIC-TYPE SEMICONDUCTOR MEMORY DEVICE

**Kouichi Kitano, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 25, 1983, Ser. No. 469,823**
**Claims priority, application Japan, Feb. 27, 1982, 57-29796**
**Int. Cl.[4] G11C *11/40***
**U.S. Cl. 365—230** **4 Claims**




1. A word-line discharging circuit in a static-type semiconductor memory device, operatively connectable to a voltage source, said static-type semiconductor memory device including a plurality of word line and hold line pairs, a plurality of memory cells, respectively, operatively connected between said plurality of word line and hold line pairs, and plurality of holding current sources, respectively, operatively connected between said hold lines of said plurality of word line and hold line pairs and the voltage source, for continually drawing holding currents from said word lines through said memory cells to said hold lines, said word lines discharging circuit comprising:

first transistors having respective bases, respectively, operatively connected to said word lines of said plurality of word line and hold line pairs, said first transistors comprising PNP transistors having respective emitters operatively connected to said corresponding word lines, and having collectors respectively, operatively connected to said bases, for detecting changes in the electric potential of said respective word lines and generating first output signals;

time-constant circuits, respectively, operatively connected to said first transistors, for delaying the first output signals of said PNP transistors and generating second output signals;

a common discharging current source;

second transistors, respectively, operatively connected between said hold lines and said common discharging current source, said second transistors each having a collector operatively connected to said corresponding hold line, a base operatively connected to receive the second output signal of said corresponding time-constant circuits, and an emitter operatively connected to said common discharging current source, said second transistors being switched ON and OFF in response to the second output signals of said time-constant circuits; and

means, respectively, operatively connected between said word lines and said common discharging current source, for slowing the rate of change in the current flowing through said word lines, said means comprising said PNP transistors.

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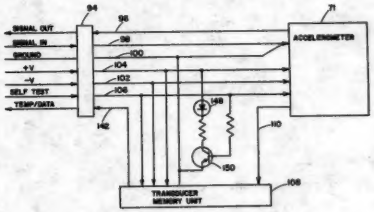
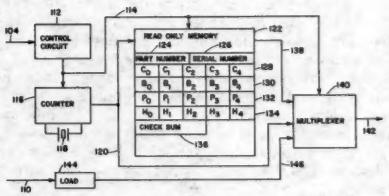
**4,611,304**

## TRANSDUCER MEMORY CIRCUIT

**R. Bruce Butenko, Bellevue; Randall B. Sprague, Redmond, and Charles D. Bateman, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.**

**Filed Jul. 27, 1983, Ser. No. 517,877**
**Int. Cl.[4] G06F *15/20, 11/30;* G01P *15/13***
**U.S. Cl. 364—571** **4 Claims**




4. In an aircraft weight and balance system having a plurality of uniquely identifiable accelerometer transducers secured to the landing gear and connected to a control computer which has been programmed to provide a self-test signal, a memory circuit for each accelerometer transducer comprising:

means for securing said memory circuit to the transducer;

an electronic memory containing data elements representing the operating characteristics of the accelerometer transducer as a function of temperature in the form of polynominal coefficients and representing the identity of the accelerometer transducer;

access means, connected to said electronic memory, for selectively accessing predetermined data elements, said access means including a counter for addressing said electronic memory, said counter being operated in response to the self-test signal from the control computer;

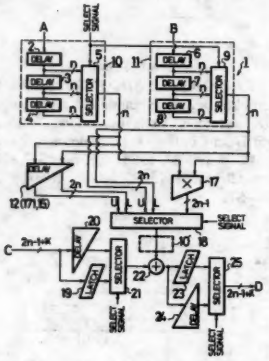
transmission means and a temperature sensor, connected to said access means, for transmitting said predetermined data elements and temperature data to the control computer and;

a light producing indicator responsive to a fault signal from the control computer, said fault signal being produced in the event that said control computer fails to receive said predetermined data elements in response to the self-test signal.

## 4,611,305
## DIGITAL SIGNAL PROCESSING CIRCUIT

**Seiichiro Iwase, Sagamihara, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Aug. 17, 1983, Ser. No. 524,079**
**Claims priority, application Japan, Jul. 18, 1982, 57-142527**
**Int. Cl.⁴ G06F *7/38, 7/44***
**U.S. Cl. 364—736** **42 Claims**



**1.** A circuit for processing multiple bit digital signals comprising a single integrated circuit chip including multiplier means for multiplying two transmitted digital signals to produce a multiple bit product signal having more significant bits thereof delayed more than less significant bits thereof, adding means for adding a summand signal to said product signal to produce a multiple bit summed signal, and means for delaying said summed signal to produce a delayed summed signal, in which said means for delaying includes first delay means for equally delaying each bit of said summed signal to produce a multiple bit first delayed summed signal, second delay means for delaying said summed signal to produce a multiple bit second delayed summed signal having less significant bits thereof delayed more than more significant bits thereof, and selector means for supplying one of said first and second delayed summed signals as an output signal of said circuit for processing.

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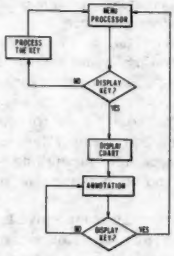
## 4,611,306
## DISPLAY MENU/CHART KEY

**Donald T. Crehan, Gaithersburg, Md., and Charles J. Lovell, Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed May 11, 1983, Ser. No. 493,572**
**Int. Cl.⁴ G06F *15/62, 3/037, 15/626;* G09G *3/02***
**U.S. Cl. 364—900** **3 Claims**



**1.** A process for interactively constructing a graphic image on a video display terminal provided with a display menu/chart key for toggling between the display of a menu and the display of a chart comprising the steps of:

displaying to an operator a construction menu listing a plurality of selectable construction parameters which define the grahic image to be constructed;

displaying a data entry menu to said operator after the construction parameters have been selected in said construction menu and allowing the operator to enter data or change data already entered in said data entry menu at any time during said process for interactively constructing a graphic image when said data entry menu is displayed;

upon detecting the actuation of said display menu/chart key while displaying said data entry menu, displaying to the operator a graphic image on said video display terminal as defined by entered and changed data at the time said display menu/chart key is activated; and

upon detecting the actuation of said display menu/chart key while displaying said graphic image, redisplaying said data entry menu so that the operator can view the progress of constructing the graphic image on said video display terminal as data is entered or changed in said data entry menu at any time during said process of interactively constructing a graphic image by toggling between the display of said data entry menu and the chart.

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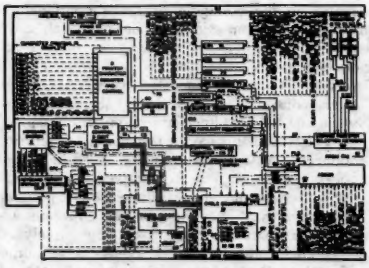
## 4,611,307
## FUNCTION ANALYZING

**Roy W. Reach, Sudbury; William M. Kahn, Brighton, and David Shapiro, Lincoln, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 455,169, Jan. 3, 1983, abandoned, which is a division of Ser. No. 292,371, Aug. 13, 1981, Pat. No. 4,381,554, which is a division of Ser. No. 60,950, Jul. 26, 1979, Pat. No. 4,309,761, which is a division of Ser. No. 731,661, Oct. 13, 1976, Pat. No. 4,198,684, which is a division of Ser. No. 390,645, Aug. 22, 1973, Pat. No. 3,996,562, which is a continuation of Ser. No. 378,221, Jun. 26, 1964, abandoned. This application Sep. 24, 1985, Ser. No. 780,225**
**Int. Cl.⁴ G06F *3/023, 3/03***
**U.S. Cl. 364—900** **14 Claims**

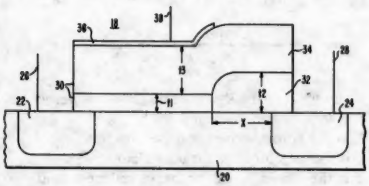


**1.** A method of source data capture, comprising the steps of initially generating coded signals representative of source data desired to be captured; visually displaying the source data, represented by the coded signals, in alphanumeric form as alphanumeric characters in response to the initial generation of the coded signals; and recording the coded signals in a magnetic storage unit from which they may be subsequently read out.

## 4,611,308
## DRAIN TRIGGERED N-CHANNEL NON-VOLATILE MEMORY

Martin L. Lonky, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 920,298, Jun. 29, 1978, abandoned.
This application Jul. 28, 1980, Ser. No. 172,726
Int. Cl.[4] G11C *11/40*; H01L *29/78, 27/02*
U.S. Cl. 365—184 27 Claims



1. An electrically alterable non-volatile memory for storing information comprising:

an array of electrically alterable non-volatile memory elements arranged in a plurality of rows and a plurality of columns,

each said non-volatile memory element includes a P-doped semiconductor substrate having first and second N-doped regions spaced apart, an insulation layer over said substrate overlaying a path from said first N-doped region to said second N-doped region, a conductive layer on top of said insulation layer overlaying a path from said first N-doped region to at least a predetermined distance from said second N-doped region, said insulation layer between said substrate and said conductive layer having a thickness to exhibit a variable threshold characteristic upon application of a first polarization voltage between said conductive layer and said substrate to cause an N-type depletion mode channel to form in said substrate extending from said first N-doped region to only a predetermined distance from said second N-doped region,

means for writing information into said array,

means for reading information from said array including,

first means for holding the potential of the conductive layer of each memory element in said array at substantially the potential of its respective substrate,

second means for selecting one row of said array in response to address signals,

third means for holding the potential of said second region of each memory element in said non-selected rows less than a predetermined positive potential with respect to its respective substrate to prevent the formation of a depletion region in each memory element from extending from said second N-doped region to at least said predetermined distance into said substrate,

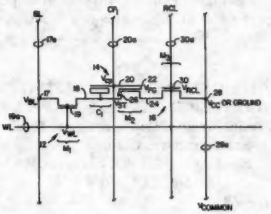
fourth means for applying a first voltage to the second region of each memory element in said selected row, said first voltage more positive than said predetermined positive potential and being of sufficient magnitude to form a depletion region in each memory element extending from said second N-doped region to at least said predetermined distance into said substrate towards said first region to intersect with said depletion mode channel at times said depletion mode channel is present to enable conduction between said first and second N-doped regions, and

means for sensing the conduction of current from said second region to said first region of each memory element in said selected row.

## 4,611,309
## NON-VOLATILE DYNAMIC RAM CELL

Patrick T. Chuang, Cupertino; Ron Maltiel, Mountain View, and Robert L. Yau, Sunnyvale, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 24, 1984, Ser. No. 654,332
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—185 40 Claims



15. A non-volatile dynamic random access memory (NVDRAM) cell of the type including a non-volatile memory element having a floating gate for storing a quantum of charge indicating a non-volatile data state and having a shadow dynamic RAM (DRAM) element having a dynamic storage capacitor for storing a quantum of charge indicating a volatile data state, said cell comprising:

means for reading and writing data into the DRAM element;

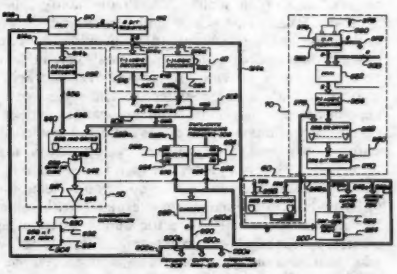
means for transferring data from the DRAM element to the non-volatile memory element in a store operation; and

means for static sensing the non-volatile data state in said non-volatile memory element to transfer data from said non-volatile memory element to said DRAM element in a recall operation.

## 4,611,310
## METHOD AND SYSTEM FOR REARRANGING DATA RECORDS IN ACCORDANCE WITH KEYFIELD VALUES

James W. Durbin, Redway, Calif., assignor to Canevari Timber Co., Fortuna, Calif.

Filed Aug. 23, 1982, Ser. No. 410,414
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 25 Claims



1. A system for arranging unique record address values corresponding to a plurality of data records wherein each record is comprised of a plurality of bits and is identified by a unique record address value, wherein one or more bits of each record comprises a keyfield and the record address values of the plurality of records are arranged in accordance with the value of said keyfields, said system comprising:

a. matrix memory means having a plurality of rows and columns, wherein each row corresponds to a different

keyfield value and each column corresponds to a different record address value;

b. first control means for setting, for each record, one memory location in the column of the matrix memory means corresponding to the record address value of that record, said memory location being in the row of the matrix memory means corresponding to the keyfield value of that record; and

c. second control means for detecting, for each row of the matrix memory means, in order of row position, the column postion of each set memory location in that row.

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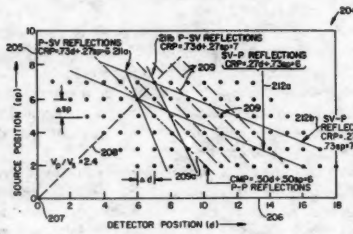
**4,611,311**

## METHOD OF SEISMIC PROCESSING INVOLVING CONVERTED P- OR S-WAVE DATA

**Clint W. Frasier, Irvine, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Apr. 20, 1983, Ser. No. 486,659**
**Int. Cl.[4] G01V *1/36***
**U.S. Cl. 367—38** **11 Claims**




1. In a method of increasing resolution of amplitude events in seismic records provided by conventional rollalong CMP collection methods involving generating conventional waves by a conventional seismic source at a series of sourcepoint locations (s), and redundantly collecting converted phases of said conventional waves as converted traces at a series of detectors positioned at known detector locations (d) along a line of survey, the improvement thereof related to processing said converted traces in an efficient manner whereby nonsymmetrical travel paths of incident and reflected rays of said generated waves are taken into account prior to trace stacking, comprising

(i) sequentially activating said conventional source at said series of sourcepoint locations and redundantly collecting at least converted phases of said conventional waves at said known detector stations (d) as provided by conventional rollalong CMP collection methods via said series of detectors so as to provide a series of converted traces each associated with a source-detector pair of known sourcepoint-detector station coordinate locations (s,d);

(ii) processing said converted traces collected in accordance with conventional CMP methods in a systematic manner to provide a series of gathers of such traces wherein each gather is associated with a true common reflection point (CRP) whose coordinates are determined with respect to the original sourcepoint-detector station locations as the converted traces were conventional collected, but which take into account the nonsymmetrical travel paths of incident and reflected rays as the traces were collected wherein each converted trace of any gather appears to have been collected as if the source was activated when located at the intersection of a vertical projection of each common reflection point and a common horizontal datum plane, followed immediately by the relocation of a detector at said same intersection for the reception of the converted phases, by the substeps of:

(a) determining the CRP coordinates of each converted trace using an equation of coordinate transformation having as independent variables the original sourcepoint-detector locational coordinates, said equation of transformation being selected from the group comprising:

$CPR=kd+(1-k)s$: for conversions of P-waves to Sv-waves at said target;

$CRP=(1-k)+ks$: for conversions of Sv-waves to P-waves at said target;

where

$$k=\frac{(V_p/V_s)}{k=[(V_p/V_s)+\{1+(X/h)\sin\alpha\}(1+f)]^{-1}};$$

$$f=\frac{(V_p/V_s)+1}{(V_p/V_s)-1+(X/h)^2\cos^2\alpha};$$

$V_p$ and $V_s$ are the P-wave and Sv-wave velocities, respectively, of the overburden;

X is the source-receiver offset distance;

h is the depth of the target reflector;

$\alpha$ is the dip angle of the target reflector; and

s and d are source and detector coordinates, respectively, along the line of survey;

(b) identifying all converted traces having substantially the same CRP coordinates as traces associated with a common reflection point gather.

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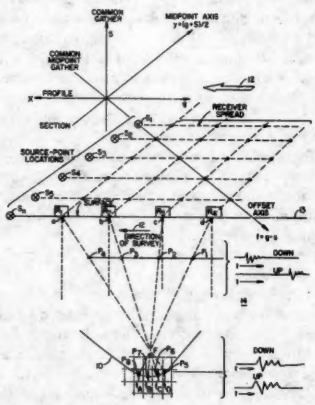
**4,611,312**

## METHOD OF SEISMIC COLLECTION UTILIZING MULTICOMPONENT RECEIVERS

**Keiichiro Ikeda, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Feb. 9, 1983, Ser. No. 465,070**
**Int. Cl.[4] G01V *1/28, 1/32***
**U.S. Cl. 367—38** **15 Claims**




1. Method for converting collected sets of P- and S-wave seismic time records each consisting of a plurality of amplitude v. time traces, into depth sections each consisting of a plurality of amplitude v. depth traces so that events on the time sections are migrated both vertically and horizontally into correct positions on the depth sections corresponding to the actual spatial positions of the reflectors in the subsurface irrespective of reflector dip, lateral velocity variation, or P- to S-wave conversion or vice versa) as well as without the need to undergo forward and inverse time-frequency transformations,

(i) generating seismic field data including at least a set of P- and S-wave records, by positioning and employing an

array of sources and multi-component detectors such that P- and S-wave traces comprising said collected set of P- and S-wave records can be redundantly indexed to sourcepoint-detector coordinates along a known line of survey, each P- and S-wave trace being associated with a particular source-detector pair from which said P- or S-wave trace was ultimately created;

(ii) for a particular P- and S-wave set associated with the same sourcepoint coordinate corresponding to source location through which said particular P- and S-wave set was ultimately derived establishing a sourcewave amplitude v. time signature trace therefor;

(iii) statistically correcting said sets of records of step (i) and said source trace of step (ii) to relate said field coordinates to a common horizontal datum plane;

(iv) for said particular set of P- and S-wave records and said source trace associated with said selected sourcepoint coordinate of step (ii), forming the time and space derivatives of a full-wave elastodynamic equation of wave propagation associated with said seismic source trace, and with P- and S-wave set to generate one or more elastic wave fields each of which being correct in time in one of a forward and backward direction;

(v) tracking and evaluating said time and space derivatives associated with said source signature trace and said P-wave and said S-wave traces wherein tracking of each wave field of such traces is down through a series of two-dimensional matrices representing common depth (z) and common horizontal (x) coordinates, but each matrix differing from its neighbor in incremental time value chosen in one of a forward and a backward timed sequence, said field tracking at any single matrix taking into account wave time-space estimates at at least two neighboring matrices;

(vi) searching the matrices of the evaluated forward and backward migrated wave fields to identify spatial and time coherence therebetween and then storing a representation of such coherence as a function of said field and depth coordinates of step (v), whereby said P-wave and S-wave fields v. depth sections can be formd irrespective of reflector dip.

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**4,611,313**

## METHOD FOR ACOUSTICALLY SURVEYING THE SURFACE CONTOURS OF THE BOTTOM OF A BODY OF WATER

**Rolf Ziese, Bremen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

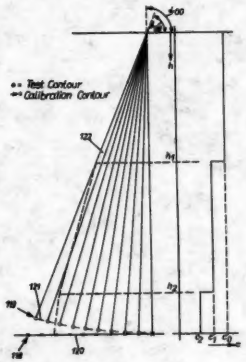
**Filed Sep. 21, 1984, Ser. No. 653,431**

**Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338050**

**Int. Cl.⁴ H04B *17/00*; G01S *9/66***

**U.S. Cl. 367—88** **7 Claims**

1. In a method for acoustically surveying the surface contours of the bottom of a body of water, particularly the bottom of the ocean, with the use of an echo sounder installed on a moving ship and including a transmitting device and a receiving device having respective antennas wherein the transmitting antenna emits sound pulses over a narrow (when seen in the direction of the ship's heading) transmitter target strip extending on the bottom of the body of water essentially perpendicularly below the center of the transmitting antenna and transversely to the ship's heading, wherein the transmitter target strip is covered, by means of the receiving antenna, by a fan which extends, in the ship's heading direction, in the form of a series of narrow receiving strips forming a row transversely to the ship's heading with one receiving strip being disposed essentially perpendicularly below the center of the receiving antenna and wherein the echoes produced at the bottom of the body of water along said transmitter target strip are received separately by the receiving antenna from individual receiving strips, travel times of received echoes are measured and depth values are determined from the travel times to produce a measured contour of said transmitter target strip extending transversely to the ship's heading, in spatial association with the respectively determined point of origin of the echoes as determined by the momentary position of said transmitter target strip and the respective said receiving strip; the improvement comprising providing compensation for the influence of sound beam diffraction by layers of water having different sound propagation speeds by: forming a calibration contour, which extends in the direction of the ship's heading essentially perpendicularly underneath the center of the receiving antenna, from a plurality of said measured contours aligned in the direction of the ship's heading; at selectable points in time, pivoting the transmitter target strip and the fan of receiving strips out of




their basic measuring position by a right angle about the elevation axis of the ship to a calibration position, utilizing the echo sounder to measure and record, as a test contour, a contour of the transmitter target strip which now extends in the direction of the ship's heading, and then pivoting the transmitter target strip and the receiving strips back to their basic measuring position; comparing said test contour with a section of said calibration contour which originated from a spatially identical strip of said bottom; deriving at least one correction value from any deviations between said compared test and calibration contours; and correcting the depth values of at least those measured contours in the vicinity of said test and calibration contours by means of said correction value in order to determine the true surface contour of said bottom.

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**4,611,314**

## METHOD FOR ACCESSING TO A ROTATING RECORD MEDIUM AND AN ACCESS CONTROL SYSTEM

**Mikito Ogata; Masahito Mori, both of Odawara; Takashi Doi, Hadano, and Michio Miyazaki, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 8, 1983, Ser. No. 483,175**

**Claims priority, application Japan, Apr. 16, 1982, 57-63294**

**Int. Cl.⁴ G11B *7/013***

**U.S. Cl. 369—32** **24 Claims**

1. A method of recording information on a rotatable disc-shaped medium having a plurality of tracks by controlling the position of a recording/reproducing head with respect to said disc-shaped medium, each track of said disc-shaped medium including a normal record area in which to record an information and an alternate record area located on said track behind the normal record area in the direction of disc rotation for recording an information in substitution for an erroneous information recorded in the normal record area of the track, comprising:

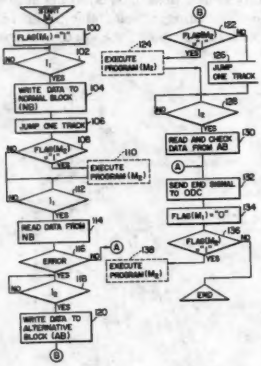
recording information in the normal record area of a first track;

detecting an error in the information recorded in the first

track by checking the information recorded in the normal record area of said first track;

recording correct information in the alternate record area of said first track when error information is detected in said normal record area of said first track;

recording information in the normal record area of a second track adjacent to said first track after the recording of information in the normal record area of said first track; and



detecting an error in the information recorded in the alternate record area of said first track by checking the information recorded in the alternate record area of said first track subsequent to recording information in the normal record area of said second track; and

detecting an error in the information recorded in said second track by checking the information recorded in the normal record area of said second track subsequent to checking the information recorded in the alternate record area of said first track.

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**4,611,315**

## OPTICAL DISK APPARATUS AND TRACK ACCESS METHOD THEREFOR

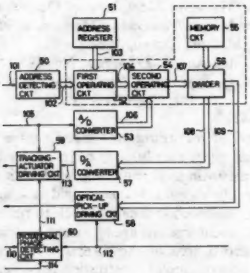
**Yasuo Ogino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 17, 1984, Ser. No. 682,233**

**Claims priority, application Japan, Dec. 20, 1983, 58-238945**

**Int. Cl.[4] G11B *5/09, 17/00***

**U.S. Cl. 369—33** **9 Claims**



1. An optical disk apparatus comprising:

an optical pickup for recording or reproducing information by irradiating an optical disk with a light beam;

tracking means for controlling said light beam in such a manner that it exactly tracks a track formed on the optical disk;

driving means for moving said optical pickup in the radial direction of the optical disk;

means for outputting a signal representing the rotational position of the optical disk; and

regularing means for, at the time of track access, terminating the tracking operation by said tracking means to move the optical pickup by said driving means and for initiating the tracking operation at the same rotational position of the disk as that at which the tracking operation is terminated, according to the signal of said signal outputting means.

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**4,611,316**

## ACTUATOR OPERATING CENTER DETECTING CIRCUIT AND OPTICAL DISK APPARATUS WITH THE DETECTING CIRCUIT

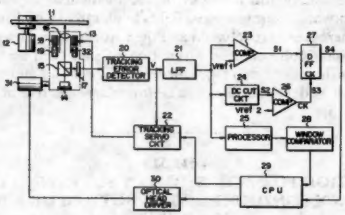
**Toyoaki Takeuchi; Ken Ohshima; Hideyuki Kenjyo; Yoshiaki Ikeda, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan**

**Filed Dec. 15, 1983, Ser. No. 561,654**

**Claims priority, application Japan, Dec. 23, 1982, 57-232037**

**Int. Cl.[4] G11B *7/00***

**U.S. Cl. 369—44** **6 Claims**



1. A detecting circuit for detecting an operating center of an actuator of an optical head comprising:

tracking signal generating means for generating a tracking signal on the basis of data read out from an optical disk by an optical head having an actuator for effecting the tracking;

first comparator means for comparing the tracking signal from said tracking signal generating means with a first reference voltage approximate to zero voltage level, to produce a binary signal as given by a level of the tracking signal relative to that of the first reference voltage;

DC cut-off means for cutting off a DC component of the tracking signal to provide the tracking signal containing only an AC component;

second comparator means for comparing the output signal of said DC cut-off means with a second reference voltage approximate to zero voltage level, to provide a second binary signal as given by a level of the output signal of said DC cut-off means relative to the second reference voltage;

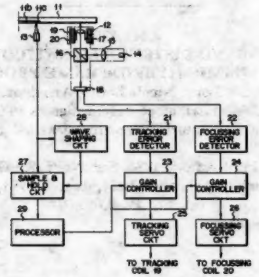
level inversion detecting means for detecting a level inversion of the first binary signal of said first comparator means at a level inverting point of the second binary signal of said second comparator means; and

means for checking an operating center of the actuator of said optical head with the detection of the level inversion.

## 4,611,317
## OPTICAL DISK APPARATUS

Toyoaki Takeuchi; Ken Ohshima; Hideyuki Kenjyo; Yoshiaki Ikeda, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,653
Claims priority, application Japan, Dec. 23, 1982, 57-232033
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—45 6 Claims




1. An optical disk apparatus comprising:

optical disk means containing a recording area having at least one first section with the same reflectivity as that of said recording area and at least one second section with a reflectivity different from that of said recording area;

first detecting means facing said optical disk means for optically detecting said first and second sections of said disk means to produce a reflectivity signal having a level corresponding to a reflectivity of said first section;

optical head means facing said optical disk means for recording and reproducing data to and from said recording area;

second detecting means for detecting tracking and focussing errors of said optical head and to generate tracking and focussing error signals;

servo means coupled to said optical head means for controlling the tracking and focussing of said optical head means; and

servo control means connected to said servo means and to said first detecting means for converting the reflectivity signal to a servo gain signal, said servo gain signal being coupled to said servo means for establishing the gain of said servo means at a value corresponding to the reflectivity of the recording area on said disk means.

## 4,611,318
## METHOD AND APPARATUS FOR MONITORING THE STORAGE OF INFORMATION ON A STORAGE MEDIUM

John S. Winslow, Altadena, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 366,123, Apr. 7, 1982, abandoned, which is a continuation of Ser. No. 106,023, Dec. 21, 1979, abandoned, which is a division of Ser. No. 890,407, Mar. 27, 1978, Pat. No. 4,225,873, which is a continuation-in-part of Ser. No. 714,133, Aug. 13, 1976, abandoned, which is a continuation of Ser. No. 508,815, Sep. 24, 1974, abandoned, which is a continuation of Ser. No. 333,560, Feb. 20, 1973, abandoned. This application Oct. 2, 1985, Ser. No. 782,170
Int. Cl.[4] G11B 27/36; G01D 18/00
U.S. Cl. 369—54 20 Claims

1. Apparatus for monitoring the recording of information on an information storage member, comprising:

means for providing a writing beam of light;

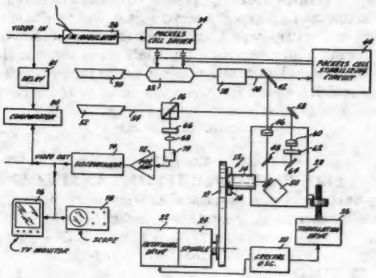
means for modulating the intensity of the writing beam of light in accordance with an input information signal to be recorded;

means for moving the information storage member in a prescribed fashion;

optical means including an objective lens for focusing the writing beam of light onto the information storage member, to record the information signal in a recording track therein;

means for providing a reading beam of light;

the objective lens of said optical means further operating to focus simultaneously the reading beam of light onto the recording track of the information storage member, the



point of impingement of the reading beam trailing that of the writing beam by a prescribed distance, the reading beam being reflected by the recording track to produce a reflected beam of light that is modulated in intensity in accordance with the recorded information signal;

means for monitoring the reflected beam of light and for producing a playback signal corresponding to its modulated intensity;

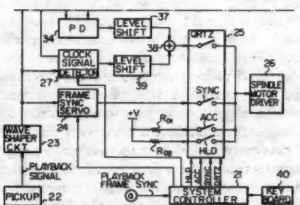
means for delaying the input information signal; and

means for comparing the playback signal with the delayed information signal.

## 4,611,319
## DISC DRIVE CONTROL SYSTEM

Ryuichi Naito, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,189
Claims priority, application Japan, Oct. 15, 1982, 57-180633; Oct. 15, 1982, 57-180634; Oct. 15, 1982, 57-180635; Oct. 15, 1982, 57-180636
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—47 6 Claims




1. A disc drive control system for controlling the drive of a disc carrying a binary digital signal including a clock information of a predetermined frequency, said digital signal including information signal portions in which positions of transition are determined in response to an information signal and synchronizing signal portions in which a maximum transition interval appears twice successively, comprising:

pickup means for detecting the digital signal on said disc;

frame sync servo signal generating means for generating a frame sync servo signal from an output signal of said pickup means, by detecting a frequency of a state in which only one positive or negative transition appears within a time period near to twice the maximum transition interval;

quartz servo signal generating means for generating a quartz servo signal by using a playback clock signal generated from the clock information of said binary digital signal and a phase difference signal indicative of a phase difference between a playback frame sync signal and a reference frame sync signal;

switch control means responsive to said frame sync servo signal and said quartz servo signal, for producing a disc drive control signal using said frame sync servo signal during a predetermined time period and using said quartz servo signal after said predetermined time period; and

a disc drive means for driving the disc in accordance with said disc drive control signal.

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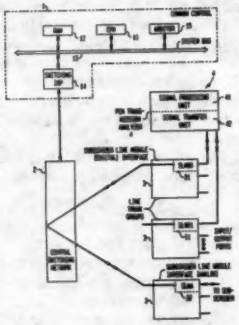
**4,611,320**

## PROGRAMMABLE TESTING ANALYZER

**Gary Southard, Coral Springs, Fla., assignor to Siemens Corporate Research and Support, Inc., Iselin, N.J.**

**Filed May 21, 1984, Ser. No. 612,206**
**Int. Cl.[4] H04J *1/16, 3/14***
**U.S. Cl. 370—13** **27 Claims**



1. A transmission test arrangement for use with a digital telecommunication system, said system including a central switch having a common control unit including a system bus and controlled by said common control unit, a switching network, and a plurality of line interface units being internally connected to said switching network and each said line interface unit being adapted to be connected to a corresponding line circuit, said test arrangement for executing performance tests on devices of said telecommunication system and comprising:

a bus-oriented microprocessor system designed for synthesizing and analyzing test signals in accordance with a particular algorithm written in a particular signal processing language, including a processor bus, and, residing on said processor bus, a microprocessor, a program memory, a main memory and a first interface module;

said first interface module being connected to said system bus for receiving test control information specifying a test procedure from the common control unit and for transmitting test results to the common control unit;

said main memory and said program memory being designed for storing intermediate data and control information for executing a test, respectively; and

a second interface module for providing an interface between a device of the telecommunication system and the bus-oriented microprocessor system, the second interface module being connected to a selected one of said line interface units for simulating an information source and sink, respectively with respect to one of said devices of the telecommunication system being temporarily linked to said selected line interface unit across the switching network under control of the common control unit, the particular algorithim written in the particular signal processing language permitting control of signal synthesis, signal analysis and signal processing functions of the transmission test arrangement, the transmission test arrangement operating in real time or off line under software control.

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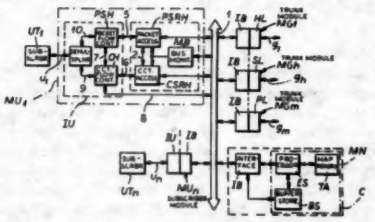
**4,611,321**

## VARIABLE-BAND DISTRIBUTED SWITCHING NODE WITH DYNAMIC HYBRID-FRAME PROCESSING

**Luciano Gabrielli, Leini; Nicola Lotito, Avigliana, and Maurizio Sposini, Valdellatorri, all of Italy, assignors to CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy**

**Filed Aug. 6, 1984, Ser. No. 638,353**
**Claims priority, application Italy, Aug. 4, 1983, 67845 A/83**
**Int. Cl.[4] H04Q *11/04***
**U.S. Cl. 370—60** **8 Claims**



1. A distributed switching node for an integrated-services telecommunication network handling circuit-switched and packet-switched communications, comprising a plurality of independent modules each individually communicating with an associated external line and with an internal bus common to all said modules, each module being divided into an input/output portion communicating with the associated external line and an interface portion with a two-way connection to said bus whereby incoming and outgoing communications can be exchanged with said associated external line by way of the associated modules and said bus, said interface portion comprising first and second flow control means for packet switched and circuit switched communications, respectively, said associated external line include local lines extending to subscriber stations and trunk lines extending to other nodes, said interface portion being substantially identical for all said modules said input/output portion including first access means, for enabling a bidirectional transfer of packet-switched communications between said first flow-control means and said bus and second access means for enabling a bidirectional transfer of circuit-switched communications between said second flow-control means and said bus, said second flow-control means comprises a bank of buffers for temporarily storing information blocks coming from and destined for said bus, a set of command units respectively controlling loading and readout of said buffers, and a logic circuit alternatively setting said command units for reading and writing, said second access means including logic circuitry for forming hybrid frames each divided into a circuit region and a packet region each accommodating a plurality of channels for outgoing and incoming circuit-switched communications and for outgoing and incoming packet-switched communications, respectively, in time slots of variable band width and number, the channels of said circuit region being established in response to request signals arriving in said packet region from said first access means and carrying indications of the required frame length, each channel of said circuit region being numerically identified for facilitating a foreshortening of

said circuit region upon a release of a preceding channel, said logic circuit exchanging information with said first flow-control means and with said second access means.

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## 4,611,322

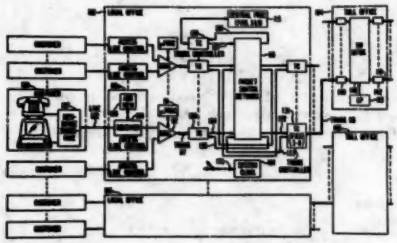
## TRAFFIC LOAD CONTROL ARRANGEMENT AND METHOD FOR A PACKET SWITCHING SYSTEM

**Mikiel L. Larson, St. Charles, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Aug. 3, 1984, Ser. No. 637,711**

**Int. Cl.⁴ H04J *3/26***

**U.S. Cl. 370—60** **47 Claims**



1. A method of communication traffic load control in a packet switch that includes a plurality of controllers each for interfacing an associated communication link to the switch, comprising the steps of:

selecting a controller to serve a communication;

notifying the selected controller of the selection;

determining the communication traffic load of the selected controller; and

the selected controller refusing to serve the communication, in response to both receipt of notice of selection and a determination that the communication traffic load of the selected controller exceeds a predetermined level.

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## 4,611,323

## METHOD FOR TRANSMITTING DIGITALLY CODED ANALOG SIGNALS

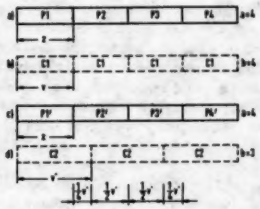
**Horst Hessenmüller, Rossdorf, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang; Philips Kommunikations Industrie AG, Nuremberg and Siemens Aktiengesellschaft, Berlin and Munich, all of, Fed. Rep. of Germany**

**Filed May 23, 1984, Ser. No. 613,381**

**Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318774**

**Int. Cl.⁴ H04J *3/16, 6/00***

**U.S. Cl. 370—79** **6 Claims**



1. A method for inserting digitally coded analog signals which are combined in coding blocks into a digital packet multiplex system in the form of packets of equal length, each packet having a packet head and a useful portion having a length which is optimized to first coding block length, comprising the steps of:

for coding blocks having a coding block length different than said first coding block length of said useful portion of said packet, generating a different plurality of coding blocks of a different coding block length such that a plurality of new useful portions of said optimized length is obtained, said plurality of new useful portions having a different format from said packet portions; and

communicating said different format of said new useful portions to said receiver with a plurality of bits available for transmission in the capacity of said packet head.

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## 4,611,324

## METHOD OF CONTROLLING A SUPERVISORY ARRANGEMENT IN A DIGITAL TRANSMISSION SYSTEM

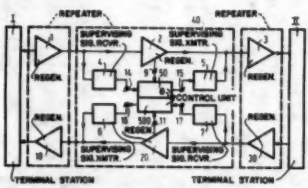
**Alberto M. Giacometti; Hans Gruijs, and Coos DeVries, all of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 7, 1984, Ser. No. 669,279**

**Claims priority, application Netherlands, Nov. 17, 1983, 8303944**

**Int. Cl.⁴ H04B *3/36, 3/46;* H04J *3/00***

**U.S. Cl. 370—97** **3 Claims**




1. A supervisory arrangement in a digital transmission system in which a plurality of repeaters are arranged between two terminal stations, wherein a call message including an address number is transmitted by one of said terminal stations to one of said repeaters for verifying the operation thereof, said address number being equal to $B-N\times A$, where B and A are constants and N is equal to the number of repeaters between said one terminal station and said one repeater, wherein said supervisory arrangement comprises a series arrangement of a supervising signal receiver for receiving a call message, a first control circuit and a supervising signal transmitter, said series arrangement being provided between an input and an output of each repeater, the control circuit having a first terminal for receiving service information from the respective repeaters, characterized in that the control circuit comprises a demultiplexer coupled to an output of said supervising signal receiver, a change-over switch having a first input coupled to a first output of said demultiplexer, an adder circuit having a first input coupled to a second output of said demultiplexer for receiving an address number contained in said call message received by said supervising signal receiver, a first number generator for generating the constant A coupled to a second input of said adder, an output of said adder being coupled to a second input of said change-over switch, a comparator having a first input coupled to said second output of said demultiplexer, a second number generator for generating the constant B coupled to a second input of said comparator, a switch control circuit for controlling said change-over switch having a control input selectively coupled to an output of said comparator, said first terminal being coupled to a third input of said change-over switch, a third number generator for generating a constant C, in which C is defined by the relationship $C+M\times A=B$, where M is any positive integer not greater than the number of repeaters in said transmission system, said third number generator being coupled to a fourth input of said change-over switch, and a multiplexer coupled to outputs of said change-over switch,

an output of said multiplexed being coupled to said supervising signal transmitter, whereby when the received address number is not equal to the constant B, the switch control circuit causes the change-over switch to couple the first input thereof and the second input, carrying the received address number incremented by A, to the outputs thereof, while, when the received address number is equal to the constant B, the switch control circuit causes the change-over switch to couple the third input thereof, carrying the service information from the first terminal of the control circuit, and the fourth terminal thereof, carrying the constant C which represents a new address number, to the outputs thereof, wherein the address C may be used by one of said terminal stations to identify the repeater supplying the service information.

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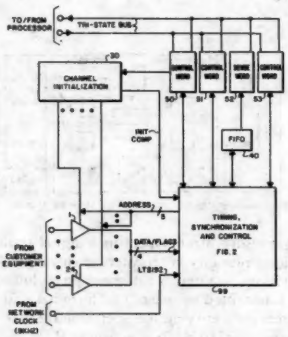
## 4,611,325
## DTMF RECEIVER SENSE AND CONTROL ARRANGEMENT

**Leo V. Jones, Jr., Glendale, and A. Lee Walsh, Phoenix, both of Ariz., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.**

**Filed Dec. 21, 1984, Ser. No. 685,198**
**Int. Cl.[4] H04J *3/12*; H04M *3/22, 3/228***
**U.S. Cl. 370—110.3** **19 Claims**




1. In a telecommunications switching system having a network clock, a DTMF receiver arrangement is connected between a plurality of DTMF receivers, which transmit customer data to said switching system, and a processor of said switching system, said DTMF receiver arrangement comprising:

control means connected to said processor, said control means being operated to store and to transmit data from said processor and to said processor;

sense means connected to said processor, said sense means being operated to store data and to transmit said stored data to said processor;

sequencing means connected to said network clock, said sequencing means being operated in response to said network clock to produce a plurality of regularly defined time slots during a DTMF receiver sampling cycle;

last look means connected to said plurality of DTMF receivers, to said sequencing means and to said network clock, said last look means being cyclically operated during each said time slot in response to said sequencing means cyclically to produce and to store an indication of whether a particular DTMF receiver has been previously sampled for valid data during a current DTMF receiver sampling cycle;

generating means connected to said control means, to said last look means and to said sequencing means, said generating means being operated in response to said indication of said last look means that said particular DTMF receiver has been previously sampled during said current DTMF receiver sampling cycle, to inhibit production of a write signal and said generating means being further operated in response to an indication of said last look means that said particular DTMF receiver is to be sampled during a corresponding time slot of said current DTMF receiver sampling cycle, to produce said write signal; and

storage means connected to said plurality of DTMF receivers, to said sequencing means, to said generating means and to sense means, said storage means being operated in response to said write signal to store said data from a particular DTMF receiver during said corresponding time slot and said storage means being further operated to transmit said stored data of each DTMF receiver to said sense means for retransmission to said processor.

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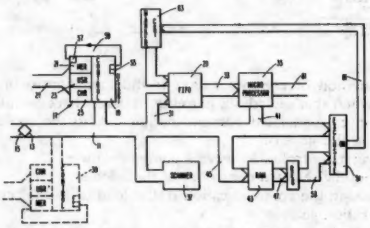
## 4,611,326
## CIRCUITRY FOR IDENTIFYING THE VALIDITY OF RECEIVED DATA WORDS

**John E. McNamara, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Mar. 28, 1983, Ser. No. 479,635**
**Int. Cl.[4] G06F *13/42***
**U.S. Cl. 371—47** **5 Claims**



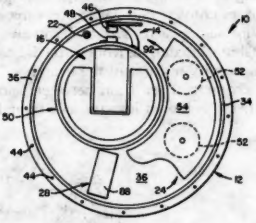

1. In a data communication system which includes a transceiver connected to a modem and which transceiver includes control circuitry and at least one bistable circuit which bistable circuitry has a first state output signal which indicates that synchronization is being sought and alternatively has a second state output signal which indicates that synchronization has been achieved, a circuit which employs said output signals from said bistable circuit to provide marker signals which indicate the validity of communication data words received by said data communication system, comprising in combination:

multi-stage register means connected to said transceiver and formed to have first stages of said multi-stage register means provide, during each time frame of regularly occurring time frames, system operating condition signals and formed to have at least one second stage available to provide during each of said time frames a binary signal which indicates synchronization being sought and alternatively synchronization achieved; circuitry means connecting said bistable circuit to said at least one second stage to provide said first and second state signals thereto; comparison circuitry means connected to said multi-stage register means to receive said system operating condition signals and said binary signal from said at least one second stage, said comparison circuitry means formed to compare said system operating condition signals and said binary signal of a prior time frame with system operating condition signals and said binary signal of a subsequent time frame whereby if there is a change in said binary signal said comparison circuitry means will provide a change output signal to so indicate; marker signal generator means connected to said comparison circuitry means to receive said change output signal and to generate a marker signal in response thereto.

## 4,611,327
## GAS TRANSPORT LASER SYSTEM

David J. Clark, Atherton, and Theodore S. Fahlen, San Jose, both of Calif., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 25, 1983, Ser. No. 555,239
Int. Cl.[4] H01S *3/02, 3/097*
U.S. Cl. 372—58 52 Claims




1. A gas transport laser system, comprising:
a vessel having a cylindrically shaped internal surface;
a structure having a cylindrically shaped external surface, the structure having an axis substantially parallel to the axis of the vessel and being positioned within the vessel so as to form a laser chamber between the external surface of the structure and the internal surface of the vessel;
means for sealing the structure within the vessel so as to contain a laser gas in the laser chamber;
gas recirculating means for flowing the laser gas through the laser chamber in a flow path so as to recirculate the laser gas between the internal surface of the vessel and the external surface of the structure;
gas exciting means positioned within the laser chamber at a discharge location for selectively producing a gas discharge; and
optically resonant means having an axis substantially parallel to the axis of the vessel and aligned with the discharge location for producing coherent radiation in response to a gas discharge.

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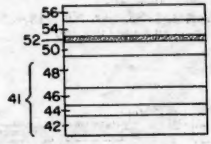
## 4,611,328
## POLARIZATION STABILIZED INGaAsP/INP LASERS

Jia-Ming Liu, Arlington, Mass., and Ying C. Chen, Closter, N.J., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 19, 1984, Ser. No. 683,779
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 2 Claims




1. A semiconductor laser device comprising:
a support structure having one or more substrate layers and one or more buffer layers, said support structure containing an equal number of substrate layers and buffer layers, said substrate layers consisting of InP, and said buffer layers consisting of $In_{1-x'}Ga_{x'}As_{y'}P_{1-y'}$ with $x' \approx 0.47y'$ and $0 < y' \leqq 1$, one of said substrate layers providing the lower surface of said semiconductor laser device and one of said buffer layers providing the upper surface of said support structure;
a first cladding layer of InP formed on said upper surface of said support structure;
an active layer formed on said first cladding layer, said active layer consisting of $In_{1-x}Ga_xAs_yP_{1-y}$ with $x \approx 0.47y$ and $y \leqq y' \leqq 1$, $y > 0$;
a second cladding layer of InP formed on said active layer; and
a cap layer of $In_{1-x''}Ga_{x''}As_{y''}P_{1-y''}$ with $x'' \approx 0.47y''$ and $0 < y'' \leqq 1$ formed on said second cladding layer;
wherein said buffer layers, said first cladding layer, said active layer, said second cladding layer, and said cap layer are substantially perfectly lattice-matched with said substrate layers at the growth temperature.

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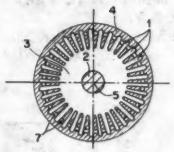
## 4,611,329
## GAS LASER

Volker Ernst, Neu Esting, and Hans Opower, Krailing, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,383
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343488
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—88 15 Claims




1. An electrically excited gas laser of circular cross section perpendicular to the direction of beam propagation, including:
an excitation chamber bounded by two concentric tube walls which serve simultaneously as electrodes for the gas discharge, and the outer tube wall having, on its inside, cavities in the form of slots disposed side-by-side, which are open toward the excitation chamber.

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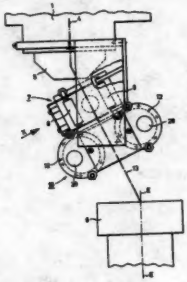
## 4,611,330
## ELECTRON BEAM VAPORIZER

Volker Bauer, Neuberg, and Horst Ranke, Filderstadt, both of Fed. Rep. of Germany, assignors to Hans Zapf, Rodgau, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,299
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339131
Int. Cl.[4] H01J *37/305*
U.S. Cl. 373—14 5 Claims

1. An electron beam vaporiser with an electron beam generator, a first magnetic deflector system with parallel, elongate pole plates for linear beam deflection along a first coordinate, and a second beam deflection system for beam deflection along a second coordinate, perpendicular to the first coordinate, and an elongate vaporising crucible for holding the material to be vaporised, in which
(a) the second magnetic deflection system has two parallel, non-magnetic coil cores, which extend parallel to the pole plates of the first deflection system and are disposed beneath them,

(b) on each coil core is arranged a first coil with a uniform number of turns per unit length of the core, and



(c) a second coil having an increased number of turns per unit length towards the two ends of the core.

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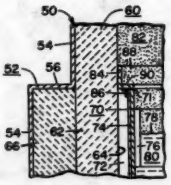
**4,611,331**

## GLASS MELTING FURNACE

**Ronald W. Palmquist, Horseheads, and Robert R. Thomas, Watkins Glen, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed May 2, 1985, Ser. No. 729,626**
**Int. Cl.[4] C03B 5/027**
**U.S. Cl. 373—30** **23 Claims**



1. In combination with a melting furnace having a refractory vessel retaining a molten bath of material and a blanket of batch material thereon to be melted with a fusion line therebetween,

a protective liner positioned within said refractory vessel and spaced from inner sidewalls thereof,

said protective liner extending from adjacent the bottom of said refractory vessel through the fusion line between the molten material and the batch material and into the batch blanket above the fusion line,

and means adjacent the upper end of said liner and above the fusion line for inhibiting the flow of batch material between the liner and said sidewalls.

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**4,611,332**

## TRANSFERRED ELECTRIC ARC

**Sven Santén, Hofors, Sweden, assignor to SKF Steel Engineering Aktiebolag, Hofors, Sweden**

**Continuation of Ser. No. 385,059, Jun. 4, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 641,404**
**Claims priority, application Sweden, Sep. 3, 1981, 8105225**
**Int. Cl.[4] H05B 7/00**
**U.S. Cl. 373—24** **5 Claims**

1. A method of chemical reduction in a shaft furnace comprising the steps of:

(a) providing a plasma arc heater having at least two cylindrical electrodes in the wall of said furnace such that the plasma gas generated by such heater may be directed into said furnace;

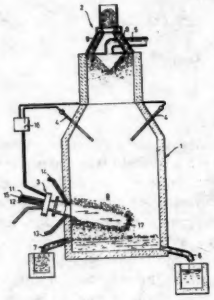
(b) continuously maintaining said furnace substantially filled with reduction material;

(c) generating a first inner electric arc between two of said at least two cylindrical electrodes;

(d) passing a reducing gas through said plasma arc heater thereby to convert said gas to a plasma gas;

(e) causing said plasma gas to burn away the reduction material immediately in front of the heater so as to form a reaction cavity in front of the heater;

(f) transferring said arc from between said two electrodes such that it is blown into the cavity and thence extends



between only one of said electrodes and said reduction material contained in the furnace, said arc being caused to substantially only so extend by providing at least one current conductor in electrical contact with said reduction material, said current conductor permitting the completion of an electric arc between the electrode and the reduction material, said current conductor being located such that substantially no electric arc extends between said electrode and said current conductor;

(g) supplying powdered material containing the material to be reduced into said cavity; and

(h) reducing said material to be reduced and withdrawing the so reduced material from the reactor.

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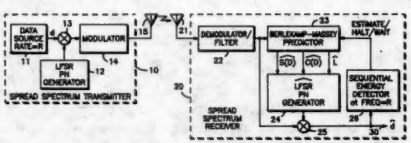
**4,611,333**

## APPARATUS FOR DESPREADING A SPREAD SPECTRUM SIGNAL PRODUCED BY A LINEAR FEEDBACK SHIFT REGISTER (LFSR)

**Ronald D. McCallister, Scottsdale; Bruce A. Cochran, Mesa, and Mary A. Bogner, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 1, 1985, Ser. No. 718,406**
**Int. Cl.[4] H04K 1/00**
**U.S. Cl. 375—1** **10 Claims**




1. Apparatus for despreading a spread spectrum signal produced by a linear feedback shift register, comprising:

input means for receiving a signal and providing a spread spectrum signal at an output thereof;

a predictor connected to receive the spread spectrum signal from the output of said input means and to provide as output signals an estimate of the length of the shift regis-

ter, an estimate of the connection polynominal of the shift register, and an estimate of the contents of the shift register producing the spread spectrum signal;

a variable length linear feedback shift register connected to receive the three output signals from said predictor and providing a pseudo random signal in response thereto on an output thereof;

a mixer connected to receive the spread spectrum signal from said input means and the psuedo random signal from said variable length feedback shift register and provide an output signal which is a mixture thereof; and

an energy detector connected to receive the output signal from said mixer, to periodically measure the instantaneous total energy in the output signal, and to provide an output signal responsive to the measure of instantaneous total energy in the output signal from said mixer, the energy detector output signal being connected to said predictor to cause said predictor to save final estimates when the measure of instantaneous total energy reaches a predetermined level.

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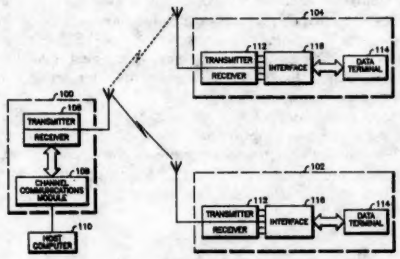
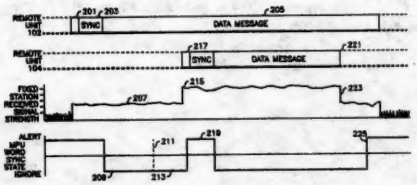
## 4,611,334
## MESSAGE CAPTURING RADIO DATA SYSTEM

**James R. Engel, Sleepy Hollow; Eugene J. Bruckert, Arlington Heights, and Stuart W. Thro, Cary, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 31, 1984, Ser. No. 646,337**
**Int. Cl.[4] H04Q *7/00***
**U.S. Cl. 375—100** **44 Claims**




1. A data communications system carrying messages preceded by a predetermined synchronization sequence of a plurality of data bits on a radio channel between a plurality of remote data units and at least one fixed station, comprising:

first means for detecting a change in radio signal level of at least a predetermined magnitude during a first message on the radio channel;

second means, responsive to detection of said change in radio signal level, for detecting the predetermined synchronization sequence of a second message;

means for timing the operation of said second means for detecting and for deactivating said second detection means after said timing means times out, thereby creating a detection window; and means, responsive to detection of the predetermined synchronization sequence of said second message, for processing said second message instead of said first message.

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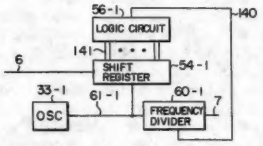
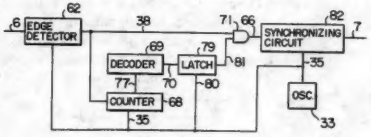
## 4,611,335
## DIGITAL DATA SYNCHRONIZING CIRCUIT

**Takao Arai; Masaharu Kobayashi, both of Yokohama; Takashi Takeuchi, Fujisawa; Eiji Okubo, and Hiroshi Endoh, both of Toyokawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 23, 1982, Ser. No. 422,190**
**Claims priority, application Japan, Sep. 30, 1981, 56-153700; Sep. 30, 1981, 56-153705; Oct. 14, 1981, 56-162835; Oct. 14, 1981, 56-162836; Oct. 14, 1981, 56-162837; Oct. 14, 1981, 56-162838**
**Int. Cl.[4] H04L *7/02***
**U.S. Cl. 375—110** **9 Claims**




1. A digital data synchronization circuit, for producing a discrimination clock signal for use in reproduction of a digital signal including a combination of pulses each having a pulse width related to a unit pulse width and defined by rising and falling pulse edges, the digital data synchronization circuit comprising:

an oscillation circuit for providing periodic pulses;

a shift register for receiving an input digital signal which may have been subjected to distortion, said shift register being connected to said oscillation circuit and having a plurality of stages through which said input digital signal is shifted under clock control by said periodic pulses received from said oscillation circuit;

a logic circuit connected to receive the output of said shift register for generating a reset pulse signal containing pulses each appearing only when the output of said shift register represents a value corresponding to a data pulse having a pulse width related to a unit pulse width to thereby discriminate the length of a pulse as measured from said rising pulse edge and/or falling pulse edge of each pulse of said input digital signal; and

a synchronizing circuit connected to receive the output of said oscillation circuit and said reset pulse signal for generating a clock pulse signal having a period equal to said unit pulse width as said discrimination clock signal irrespective of distortion in said input digital data signal, wherein said periodic pulses from said oscillation circuit are applied to said shift register without being phase locked to said input digital signal.

4. A digital data synchronization circuit for producing a discrimination clock signal for use in reproduction of a digital signal including a combination of pulses each having a pulse width related to a unit pulse width and defined by rising and falling pulse edges, the digital data synchronization circuit comprising:

an edge detector for receiving an input digital signal which may have been subjected to distortion and for generating a first pulse signal containing pulses representative of other rising pulse edges and/or falling pulse edges in said input digital signal, said input digital signal possibly containing at least one pulse having a pulse width not related to said unit pulse width;

a synchronizing circuit for generating a clock pulse signal having a period equal to said unit pulse width of the digital signal;

a clock source for providing periodic pulses to said synchronizing circuit;

a counter for counting the periodic pulses from said clock source under control of said first pulse signal from said edge detector;

a first decoder connected to receive the instantaneous output of said counter for generating therefrom a second pulse signal containing pulses each appearing when the output of said counter reaches a value related to said unit pulse width to thereby determine the length of time as measured from said rising pulse edge and/or falling pulse edge of each of said pulses of said first pulse signal; and

a coincidence circuit connected to receive said first pulse signal from said edge detector and to receive said second pulse signal from said first decoder for gating said first pulse signal with said second pulse signal to thereby produce a reset signal only when said input signal is not distorted, said counter being immediately changed away from said value related to said unit pulse width with said first decorder immediately reflecting said change, said reset signal being applied as the output of said coincidence circuit to control said synchronizing circuit, whereby a clock pulse signal having a period equal to said unit pulse width is generated from said synchronizing circuit as said discrimination clock signal irrespective of distortion in said input digital data signal.

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**4,611,336**

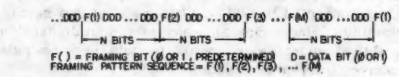
## FRAME SYNCHRONIZATION FOR DISTRIBUTED FRAMING PATTERN IN ELECTRONIC COMMUNICATION SYSTEMS

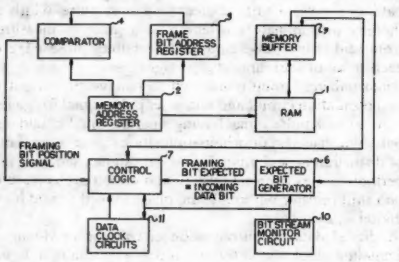
**Warren R. Fryer, New York, N.Y., assignor to Calculagraph Company, East Hanover, N.J.**

**Continuation-in-part of Ser. No. 582,077, Feb. 21, 1984, abandoned. This application Nov. 19, 1984, Ser. No. 672,850**

**Int. Cl.[4] H04L** *7/08;* **H04J** *3/06*

**U.S. Cl. 375—111** **5 Claims**


...DDD F(1) DDD ... DDD F(2) DDD ... DDD F(3) ... F(M) DDD ...DDD F(1)
N BITS
N BITS
N BITS
F( ) = FRAMING BIT (Ø OR 1 , PREDETERMINED)
FRAMING PATTERN SEQUENCE = F(1), F(2), F(3), ... F(M)
D = DATA BIT (Ø OR 1)




4. A frame-bit synchronizer constructed to operate in a framing mode searching for a framing pattern sequence in a serial bit stream consisting of M framing bits distributed as single bits at intervals of a fixed number, N, of bits, where N is the number of bits from the start of one framing bit in the serial bit stream to the start of the next, comprising in combination:

a source of said serial bit stream;

a generator of clock signals synchronized with the repetition of rate of said serial bit stream;

a random access memory with exactly N locations used, each position corresponding to one position in the N bit interval;

an N state memory address register connected, upon receipt of a clock signal from said clock signal generator, to address each of the N locations of said random access memory sequentially and to change the state thereof to produce a count with each bit received from said source, wherein said memory address register always points to the same location in said random access memory during the corresponding clock interval of said framing bit;

an expected bit generator having said framing pattern sequence pre-set in its circuitry;

a memory buffer constructed and arranged in accordance with each bit location in said N bit interval, to be cleared whenever the bit received is not the same as the bit expected from said expected bit generator corresponding to the framing pattern sequence so far detected at that bit position as determined by the count stored in said random access memory, and to be incremented whenever the incoming bit received is the same as the bit expected according to said framing pattern sequence;

combination circuit means coupled to said random access memory and including said source of said serial bit stream constructed and arranged to accept as input the contents of the currently-addressed memory location of said random access memory and the value (0 or 1) of the incoming serial bit stream to provide an output signal to said memory buffer that indicates whether its contents should be cleared or incremented; and

means comprising a frame declaration circuit responsive to a preselected application-dependent count V in said memory buffer, which may be chosen to be other than M, for confirming that a preselected framing criterion has been met and that true frame has been discovered in the serial bit stream.

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**4,611,337**

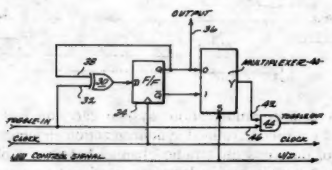
## MINIMAL LOGIC SYNCHRONOUS UP/DOWN COUNTER IMPLEMENTATIONS FOR CMOS

**Michael W. Evans, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.**

**Filed Aug. 29, 1983, Ser. No. 527,470**

**Int. Cl.[4] H03K** *23/04*

**U.S. Cl. 377—123** **9 Claims**




1. An up/down (U/D) counter for counting a toggle-in signal, said counter having two or more stages, each stage comprising:

a clock flip-flop having a data input and Q and $\overline{Q}$ outputs providing a counter stage output at one of said outputs;

a feedback circuit including an exclusive-OR gate having an input coupled to an output of said flip-flop and a second input adapted to receive a toggle-in signal and an output signal coupled to said data input of said flip-flop; and

a multiplexer having a first input coupled to said Q output of

said flip-flop and a second input coupled to said $\overline{Q}$ output of said flip-flop and a single switch control input which, depending upon the binary state of an applied up/down count control signal, selectively connects either said first input or said second input to a multiplexer output port providing toggle out data for input to another of said counter stages.

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**4,611,338**

## CHANNEL INDUCTION FURNACES

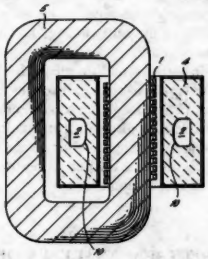
**Douglas C. Lillicrap, Waverton, United Kingdom, assignor to The Electricity Council, England**

**Filed Sep. 11, 1984, Ser. No. 649,335**

**Claims priority, application United Kingdom, Feb. 21, 1984, 8404568**

**Int. Cl.[4] H05B *5/14***

**U.S. Cl. 373—161** **11 Claims**



1. A channel induction furnace comprising means defining a bath for containing molten metal, means defining a channel-forming loop extending downwardly from the bath, a ferromagnetic core forming a closed magnetic circuit linked with the channel, and an alternating current energised induction coil on the core, the channel wall nearest the induction coil being shaped to follow a contour of constant current density or to follow a contour of constant static pressure.

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**4,611,339**

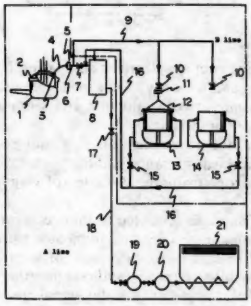
## METHOD AND APPARATUS FOR REMOVAL OF IMPURE GASES AT TIME OF SCRAP PREHEATING

**Kazunori Saitoh, Tokyo, Japan, assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa., a part interest**

**Filed Nov. 14, 1983, Ser. No. 543,974**

**Int. Cl.[4] F27D *13/00***

**U.S. Cl. 373—80** **9 Claims**



8. Apparatus for preheating scrap metal with impure gases containing particulates and discharging from a metallurgical furnace,

a container for scrap metal having an inlet and an outlet,

first means for dividing the gases discharging from said furnace into first and second portions,

means for conducting said first portion of the gases discharging from said metallurgical furnace to the inlet of said container,

a combustion chamber for burning waste gases and having an inlet and an outlet,

second means for conducting said second portion of said gases to the inlet of said combustion chamber,

means for conducting waste gases from the outlet of said container to the inlet of a combustion chamber,

particulate removing means for removing particulates from waste gases, and

means for conducting combustion products from the outlet of the combustion chamber to the particulate removal means.

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**4,611,340**

## APPARATUS FOR EXAMINING A BIOLOGICAL OBJECT BY USING RADIATION

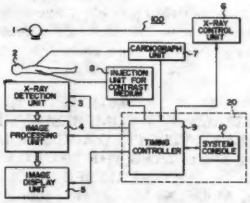
**Kiyoshi Okazaki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 17, 1984, Ser. No. 611,150**

**Claims priority, application Japan, May 20, 1983, 58-88952**

**Int. Cl.[4] A61B *6/00*; H04N *5/32*; H05G *1/10***

**U.S. Cl. 378—95** **4 Claims**




1. An apparatus for producing video difference images of an object having heart beats from X-ray images obtained from X-ray radiation passed through that object, comprising:

means for detecting said heart beats of the object to be diagnosed;

means for producing first video signals corresponding to a first X-ray image occurring at a predetermined phase of a first one of said heart beats;

means for subsequently injecting said object with an X-ray contrast media;

means for producing second video signals corresponding to a second X-ray image occurring at the same phase of a later second one of said heart beats as that of said first heart beat, delayed from said first heart beat by a predetermined number of said heart beats dependent upon the expected distribution of said X-ray contrast media within said object;

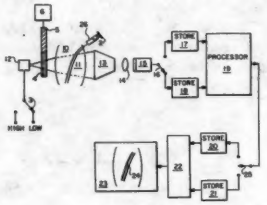
means for subtracting said first video signals from said second video signals to produce difference video signals of said object; and

means for displaying an X-ray image of said object corresponding to said difference video signals.

## 4,611,341
## MULTIPLE-ENERGY X-RAY SUBSTRACTION IMAGING SYSTEM

**William R. Brody, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

**Continuation of Ser. No. 260,694, May 5, 1981, Pat. No. 4,445,226. This application Feb. 6, 1984, Ser. No. 577,074**
**The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.**
**Int. Cl.[4] G03B *41/16***
**U.S. Cl. 378—99** **3 Claims**




1. Apparatus for providing an isolated image of an iodinated contrast material administered into a region of the body comprising:

means for making separate x-ray transmission measurements at the lower and upper parts of the diagnostic x-ray spectrum, said lower part being in the spectrum of 40–70 Kev and said upper part being in the spectrum of 70–120 Kev;

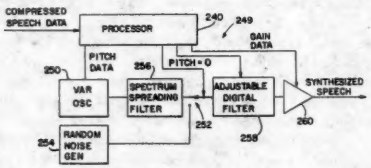
means for processing these measurements to produce a data set representing projection image data where the soft tissue information has been substantially cancelled; and

means for subtracting data sets representing measurements taken before and after the administration of the iodinated contrast material to provide image information representing substantially only the iodine content whereby soft tissue motions have been cancelled.

## 4,611,342
## DIGITAL VOICE COMPRESSION HAVING A DIGITALLY CONTROLLED AGC CIRCUIT AND MEANS FOR INCLUDING THE TRUE GAIN IN THE COMPRESSED DATA

**William J. Miller, N. Miami, Fla.; Ran F. Chiu, Los Altos, Calif.; Richard B. Joerger, Pembroke Pines, Fla., and Frank W. Newdeck, Hatboro, Pa., assignors to Racal Data Communications Inc., Miami, Fla.**

**Filed Mar. 1, 1983, Ser. No. 471,139**
**Int. Cl.[4] G10L *5/00***
**U.S. Cl. 381—36** **20 Claims**




1. An apparatus for use in the transmission of digital voice data, comprising a digital voice processor including:

an analyzer means for compressing digitized voice data according to an algorithm including a measured root mean square of the digitized voice data being compressed;

an analog-to-digital conversion means for converting an analog voice signal to digitized voice data as an input to the analyzer means;

an automatic gain control means within the analog-to-digital conversion means for controlling the gain of the analog voice signal prior to the analog voice signal being digitized, such that the digitized voice data input to the analyzer means has a root mean square within selected limits, the setting of the automatic gain control means being responsive to the value of the root mean square of the digitized voice data, as measured by the analyzer means;

means for including in the digitized voice data, compressed for transmission, data representative of the root mean measured in the analyzer means, adjusted by the inverse of the change induced in the gain of the automatic gain control means in order to maintain the analyzer means root mean square within the selected limits;

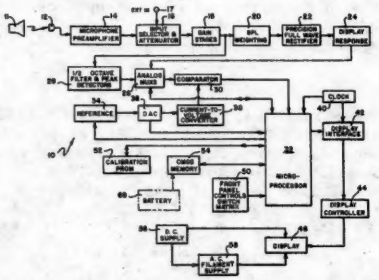
the automatic gain control means including a gain setting means for setting the gain in a stepwise fashion, with each step constituting a change in the gain of a selected value from the previous gain setting, in response to a digital output gain signal;

an output gain signal selection means for selecting the digital output gain signal in response to the relation between the most recent peak root mean square measured by the analyzer and a selected ideal root mean square value plus or minus a selected range value; and, a voice synthesizer means receiving said output gain signal for generating a synthesized voice signal.

## 4,611,343
## AUDIO SPECTRUM ANALYZER OPERABLE IN A DIFFERENCE MODE

**Mark Rapaich, Stevensville, Mich., assignor to Heath Company, Benton Harbor, Mich.**

**Filed Jun. 29, 1984, Ser. No. 625,940**
**Int. Cl.[4] H03G *5/00***
**U.S. Cl. 381—103** **7 Claims**




1. An audio spectrum anaylzer for comparing first and second audio signals and for providing a real-time display of the difference spectrum between said first and second audio signals, said analyzer comprising:

receiver means for receiving said first and second audio signals and a third reference audio signal;

memory means for storing the spectrum of a signal provided thereto;

signal processing means coupled to said receiver means and to said memory means for providing said third reference audio signal to said memory means for storing the spectrum of said third reference audio signal therein and for reading said third reference audio signal spectrum therefrom;

comparator means coupled to said receiver means and to said signal processing means for comparing the spectra of said first and second audio signals with the spectrum of said third reference audio signal and for providing to said

signal processing means a first difference signal representing the difference between the audio spectra of said first audio signal and said third reference audio signal for storage in said memory means and for subsequent recall therefrom and comparison by said comparator means with a second difference signal representing the difference between the audio spectra of said second audio signal and said third reference audio signal in generating and providing a third difference signal representing the difference between said first and second difference signals to said signal processing means; and

display means coupled to said signal processing means and responsive to said third difference signal for displaying the real-time difference spectrum between said first and second audio signals.

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**4,611,344**

## ELECTRONIC VOLUME CONTROL CIRCUIT

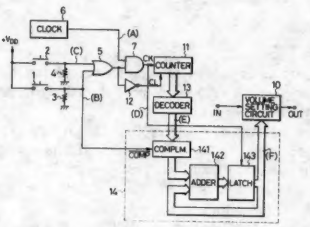
**Akira Hayama, and Shinichi Suzuki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Dec. 7, 1984, Ser. No. 679,436**

**Claims priority, application Japan, Dec. 7, 1983, 58-189796[U]**

**Int. Cl.⁴ H03G *1/02***

**U.S. Cl. 381—108** **4 Claims**




1. An electronic volume control circuit in which addition and subtraction of digital data are carried out according to up and down instruction signals, respectively, and volume control of a predetermined signal is performed with volume data produced according to results of said addition or subtraction, said volume control circuit comprising:

means for producing a digital signal indicative of one of a duration of said up or down instruction signal and a number of instances of said up or down instruction signal;

decoding means for converting said digital signal into data indicative of a step size of an increase or decrease of said volume data, according to a predetermined conversion table; wherein the values in the predetermined conversion table are non-linear with respect to the valve of the digital signal;

arithmetic means operating in response to an output of said decoding means for increasing and decreasing said volume data, by an amount equal to said step size determined by said decoding means, according to said up and down instruction signals, respectively; and

means for setting a volume of said predetermined signal in response to a result of calculation produced by said arithmetic means.

**4,611,345**

## BANK BILL IDENTIFICATION DEVICE

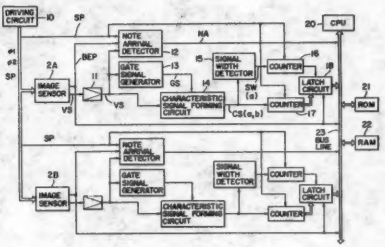
**Kazuhiko Ohnishi, and Masaaki Hayashi, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan**

**Filed Feb. 15, 1984, Ser. No. 580,364**

**Claims priority, application Japan, Apr. 6, 1983, 58-60576**

**Int. Cl.⁴ G06K *9/00***

**U.S. Cl. 382—7** **13 Claims**




1. A bank bill identification device which comprises:

a conveying means which conveys a note in a predetermined direction;

a light source which projects light onto said note;

one-dimensional image sensors which are arrayed linearly in a predetermined direction of said note and which repeatedly output in time series signals corresponding to the light reflected from said note when said sensors scan said note;

a characteristic signal forming means which encodes the output from said one-dimensional image sensors to form first characteristic signals of a signal width corresponding to the width of the numerical figures representing a denomination printed on a surface of said note;

a signal pulsewidth detecting means which inputs said first characteristic signals from said characteristic signal forming means and outputs second characteristic signals which indicate that said width of the numerical figures representing said denomination of said note exceed a second predetermined value when said first characteristic signals exceed a first predetermined value in their pulsewidth; and

a memory/arithmetic means which stores the number of said first characteristic signals from said characteristic signal forming means and the presence of said second characteristic signals from said signal pulsewidth detecting means for each scanning of said note by said one-dimensional image sensors, and which computes the thus stored data, and which compares the data with the data which has been stored data, and compares the data with the data which has been stored corresponding to denominations of notes, and identifies the denomination of said note.

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**4,611,346**

## METHOD AND APPARATUS FOR CHARACTER RECOGNITION ACCOMMODATING DIACRITICAL MARKS

**Gregory M. Bednar, Matthews; George B. Fryer, and Manthri S. Narasimha, both of Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 29, 1983, Ser. No. 537,279**

**Int. Cl.⁴ G06K *9/36***

**U.S. Cl. 382—9** **18 Claims**

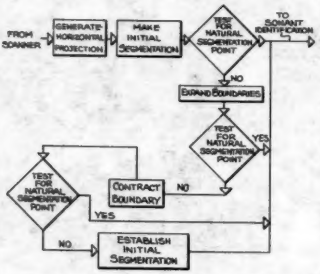
1. A method of processing data for recognizing unknown characters of a known character set, some of the characters having diacritical marks associated therewith, said method comprising the steps of:

storing the image data representing an entire unknown char-

acter, including any overlapping or non-overlapping diacritical marks associated therewith;

segmenting the stored image data to represent individual unknown characters including any diacritical mark associated therewith;

extracting from the stored image data that portion of the image data representing a predetermined localized area of the unknown character corresponding to the expected location of a diacritical mark;




classifying the segmented image data to provisionally distinguish larger characters which may include a diacritical mark from smaller characters which may not include a diacritical mark;

examining the extracted diacritical mark image data and at least a portion of the non-extracted stored image data of the unknown character with the provisional distinction between the larger and smaller characters to recognize the unknown character and any diacritical mark associated therewith.

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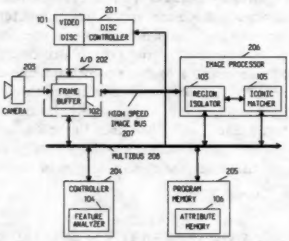
## 4,611,347
## VIDEO RECOGNITION SYSTEM

**Arun N. Netravali, Westfield, and Jakub Segen, Fair Haven, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Sep. 24, 1984, Ser. No. 653,213**
**Int. Cl.[4] G06K *9/62***
**U.S. Cl. 382—27** **11 Claims**




1. A method of operating an image recognition system comprising the steps of:

segmenting a video image into two or more regions based on variations in intensity in said video image;

screening the characteristics of each of said regions by comparing curvature and orientation attributes of selected local features of regions with reference features stored in an attribute memory and identifying one or more sets of reference features from said attribute memory which closely resemble a set of selected local features of each region;

retrieving one or more reference images for each regions from an image memory using addresses from the screening and identifying step;

for each of the reference images, computing a horizontal and a vertical offset by matching each of said selected local features with each of said reference features; and

using the offsets computed in the previous step, aligning and matching the intensity of each of said regions against the intensity of each of the retrieved reference images for that region to determine one reference image which most closely matches that region.

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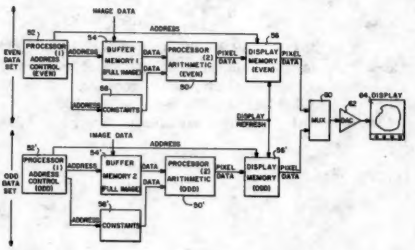
## 4,611,348
## APPARATUS FOR ALTERING THE SPATIAL CHARACTERISTICS OF A DIGITAL IMAGE BY POLYNOMIAL INTERPRETATION USING SETS OF ARITHMETIC PROCESSORS

**Eugene C. Williams, Waukesha, and Phil E. Pearson, Jr., Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.**

**Filed Nov. 26, 1984, Ser. No. 675,056**
**Int. Cl.[4] G06F *3/14***
**U.S. Cl. 382—44** **8 Claims**




1. Apparatus for use in calculating image data for a spatially varied image using high order polynomial algorithms for pixel interpolation comprising

a buffer memory for storing first image data,

a display memory for storing second image data based on interpolations of said first image data,

a constants memory for storing constants for use in polynomial interpolation,

a first processor for receiving said first image data from said buffer memory and constants from said constants memory and operating on said first image data in accordance with a polynomial interpolation algorithm, said first processor generating spatially varied image data therefrom for storage in said display memory, and

a second processor interconnected with said buffer memory, said display memory, said constants memory, and said first processor for controlling the calculating of spatially varied image data.

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## 4,611,349
## HALFTONE IMAGE SCALING

**Hsieh S. Hou, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.**

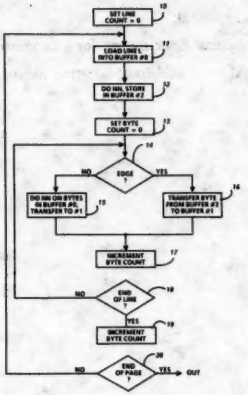
**Filed Aug. 13, 1984, Ser. No. 640,200**
**Int. Cl.[4] G06K *9/36***
**U.S. Cl. 382—47** **12 Claims**

1. A method of reducing or enlarging a one bit per pixel halftone representation of an image on a line by line basis comprising the steps of:

determining whether the current halftone segment is on an image edge,

if the current segment is on an edge, using for the current segment of the reduced or enlarged image a correspond-

ing segment produced by applying the nearest neighbor algorithm to the original image on a bit by bit basis, or if the current segment is not on an edge, using for the current segment of the reduced or enlarged image a corresponding segment produced by applying the nearest neighbor algorithm to the original image on a segment by segment basis, thereby preventing Moire patterns in the solid state areas, jaggedness at the edges, and a change of pitch, and repeating this process for the remaining lines of the image.


SET LINE COUNT = 0
LOAD LINE 1 INTO BUFFER #0
DO MIL STORE IN BUFFER #2
SET BYTE COUNT = 0
EDGE ?
NO
YES
DO MIL ON BYTES IN BUFFER #0, TRANSFER TO #1
TRANSFER BYTE FROM BUFFER #1 TO BUFFER #1
INCREMENT BYTE COUNT
END OF LINE ?
INCREMENT BYTE COUNT
END OF PAGE ?
OUT

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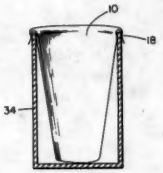
**4,611,350**

## BAG HAVING A BAND OF REDUCED DIAMETER

**David J. Kaczerwaski, Manchester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Oct. 17, 1984, Ser. No. 661,746**
**Int. Cl.[4] B65D *33/00***
**U.S. Cl. 383—7** **7 Claims**




1. A sack of a thermoplastic film comprising an open mouth region, a body region and a closed bottom region, said body region having at least one cold-strected, circumferential band region of reduced film thickness and of reduced diameter therein, said reduced film thickness and diameter being in relation to the film thickness and diameter of said body region.

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**4,611,351**

## BEARING MOUNTING DEVICE

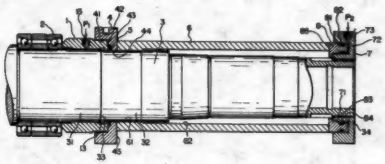
**Shinya Nakamura, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 29, 1985, Ser. No. 728,022**
**Claims priority, application Japan, May 10, 1984, 59-67140[U]**
**Int. Cl.[4] F16C *27/00***
**U.S. Cl. 384—99** **3 Claims**

1. A device for mounting a bearing on a shaft with an axial preload comprising:

a sleeve tightly fixed on the shaft to hold the bearing in an axially preloaded state, the sleeve having an inner periphery with such a diameter that the sleeve is tightly fitted on the shaft, a first circumferential oil groove formed in the inner periphery, a second circumferential oil groove formed in the inner periphery axially apart from the first oil groove, a third oil groove communicating between the first and second oil grooves and a hole formed through the sleeve to supply a first pressurized oil to the first oil groove;

a mechanism for applying the axial preload to the bearing, the mechanism including a cylindrical member fitted on the shaft and having an annular recess open axially toward said sleeve and a hole in communication with the recess to supply a second pressurizsed oil to the recess, and annular means including a piston member for extending between



the sleeve and cylindrical member, one end of the annular means being received in the recess and another end of the annular means being abutted with the sleeve,

whereby when the bearing is mounted on the shaft, the first pressurized oil may be supplied to the first oil groove of the sleeve through the hole of the sleeve to expand the sleeve radially, the second pressurized oil may then be supplied to the recess of the cylindrical member through the hole of the cylindrical member so that the annular means including the piston member is moved axially to apply a preload to the bearing, the pressure of the first pressurized oil may then be released from the first oil groove so that the sleeve returns to its original state while still applying the second pressurized oil to the recess, and thereafter the pressure of the second pressurized oil may be released from the recess.

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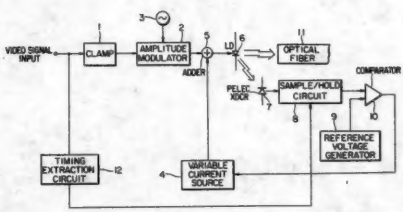
**4,611,352**

## OPTICAL TRANSMISSION APPARATUS

**Katsuyuki Fujito; Hiroaki Nakata, and Takeshige Ichida, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 6, 1983, Ser. No. 529,546**
**Claims priority, application Japan, Mar. 31, 1983, 57-57578**
**Int. Cl.[4] H04B *9/00***
**U.S. Cl. 455—609** **7 Claims**




6. An optical transmission apparatus comprising:

clamp means for clamping an input video signal;

high-frequency oscillator means for producing a high-frequency oscillation signal;

amplitude modulator means for modulating the high-fre-

quency oscillation signal with the clamped video signal to produce a modulated video signal;

light emitting means for producing an output light signal in response to said modulated video signal from said amplitude modulator means;

variable current source means for adding a current to said modulated video signal;

said variable current source means providing a bias current to said light emitting means for substantially linear operation of said light emitting means, said bias current being substantially equal to a threshold current to adjust the current of said modulated video signal in response to said output light signal;

multimode optical fiber means for transmitting said output light signal from said light emitting means.

# DESIGN PATENTS

## GRANTED SEP. 9, 1986

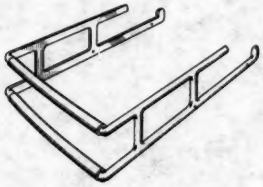
### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D21–150 | 285,599 |

# DESIGNS

SEPTEMBER 9, 1986

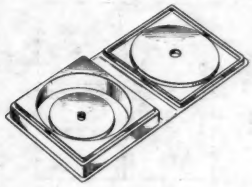
285,500
TOES PROTECTOR
Richard L. Shaffner, 1640 Damon Ct., Dunwoody, Ga. 30338
Filed May 14, 1984, Ser. No. 609,694
Term of patent 14 years
U.S. Cl. D2—314



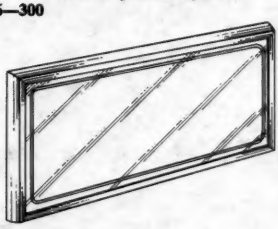
285,501
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,698
Term of patent 14 years
U.S. Cl. D2—405

285,502
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Nov. 16, 1984, Ser. No. 672,281
Term of patent 14 years
U.S. Cl. D2—422

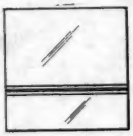
285,503
CONTAINER FOR A TYPE FONT DISC
Alvin J. Weiner, 112 Warren St., Randolph, Mass. 02368
Filed Feb. 14, 1984, Ser. No. 580,065
Term of patent 14 years
U.S. Cl. D3—35

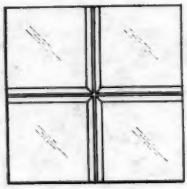


285,504
PLACARD HOLDER
William K. Messer, Birmingham, Ala., assignor to Gust Vaginos, Beachwood, Ohio
Filed Dec. 20, 1982, Ser. No. 456,996
Term of patent 14 years
U.S. Cl. D6—300

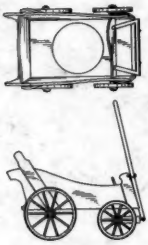


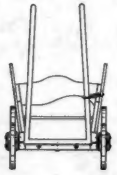
285,505
WALL MIRROR
Frank Billiet, Kortrijk, Belgium, assignor to Mirodan, Etn. L. d'Haene & Zonen, Kortrijk-Heule, Belgium
Filed Apr. 12, 1983, Ser. No. 484,211
Term of patent 14 years
U.S. Cl. D6—300





285,506
SUPPORT FOR FLOWER POTS
Hermanus J. H. Mens, Von Bonninghausenlaan 36, 2162 et Lisser, Netherlands
Filed Apr. 10, 1984, Ser. No. 598,630
Term of patent 14 years
U.S. Cl. D6—404



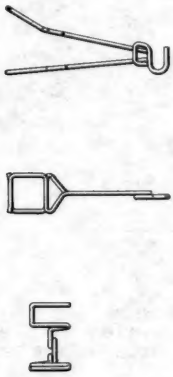


285,507
LECTERN
Richard A. Middlemist, 7820 Faribault St., Golden Valley, Minn. 55427
Filed Feb. 1, 1984, Ser. No. 575,772
Term of patent 14 years
U.S. Cl. D6—419

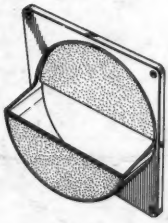
285,508
BALCONY TRAY
Paul C. Murphy, 218 Magnolia Way, Huntsville, Tex. 77340
Filed Mar. 12, 1984, Ser. No. 588,702
Term of patent 14 years
U.S. Cl. D6—429

285,509
HANGER FOR PERSONAL CARE PRODUCTS FOR USE WITH SHOWERS
Abbe J. Sussman, Chicago, Ill., assignor to Madden Corporation, Chicago, Ill.
Filed Feb. 22, 1984, Ser. No. 582,280
Term of patent 14 years
U.S. Cl. D6—525

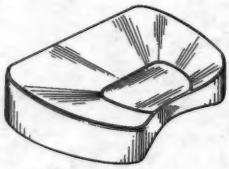
285,510
BRACKET FOR A HANGING PLANT, OR SIMILAR ARTICLE
James T. Douglas, P.O. Box 6105, Crestline, Calif. 92325, and Harry E. Bisher, P.O. Box 51, Desert Hot Springs, Calif. 92240
Filed May 29, 1984, Ser. No. 614,858
Term of patent 14 years
U.S. Cl. D6—556



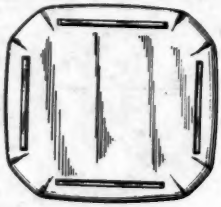
285,511
STORAGE RACK FOR COVERS FOR CONTAINERS
Dominick Loscalzo, Whitestone, and Howard W. Michaelson, Coram, both of N.Y., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Nov. 4, 1983, Ser. No. 549,337
Term of patent 14 years
U.S. Cl. D6—573

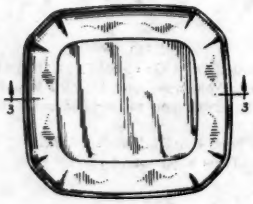


285,512
PILLOW
Robert A. Bool, East Brisbane, Australia, assignor to Ozzzlo Pty. Ltd., Australia
Filed Aug. 10, 1984, Ser. No. 639,428
Claims priority, application Australia, Apr. 12, 1984, 7147/84
Term of patent 14 years
U.S. Cl. D6—601

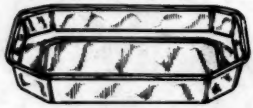


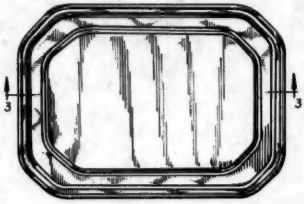
285,513
PLATE
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Oct. 5, 1983, Ser. No. 539,326
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, MR20974
Term of patent 14 years
U.S. Cl. D7—1



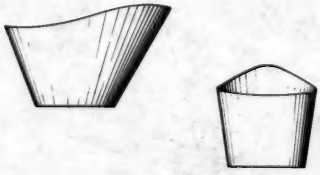


285,514
CASSEROLE DISH
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Oct. 5, 1983, Ser. No. 539,325
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, MR20974
Term of patent 14 years
U.S. Cl. D7—1



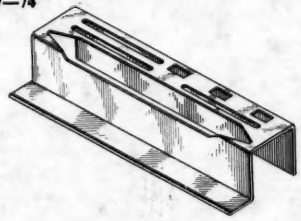


285,515
CUP FOR ADMINISTERING MEDICINE
Suzanne Papciak, R.D. #5, Box 363, Quakertown, Pa. 18951
Filed Aug. 25, 1983, Ser. No. 526,497
Term of patent 14 years
U.S. Cl. D7—6

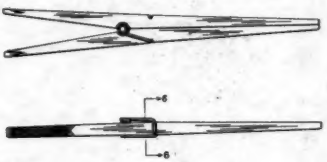


285,516
MUG OR SIMILAR ARTICLE
Lawrence J. Miller, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jul. 8, 1983, Ser. No. 512,069
Term of patent 14 years
U.S. Cl. D7—9

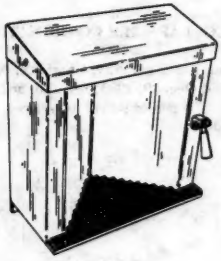
285,517
UTENSIL RACK
John R. Paulus, Wichita, Kans., assignor to Pizza Hut, Inc., Wichita, Kans.
Filed Feb. 9, 1984, Ser. No. 578,706
Term of patent 14 years
U.S. Cl. D7—74



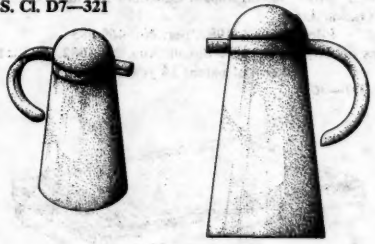
285,518
SPRING ACTUATED CHOP STICKS
Clive Hollinshead, 29572 Spotted Bull La., San Juan Capistrano, Calif. 92675
Filed Feb. 23, 1984, Ser. No. 583,005
Term of patent 14 years
U.S. Cl. D7—105



285,519
WATER DISPENSER
Paul S. Giovagnoli, Kansas City, Mo., assignor to Durastill, Inc., Kansas City, Mo.
Filed Oct. 5, 1983, Ser. No. 539,181
Term of patent 14 years
U.S. Cl. D7—311

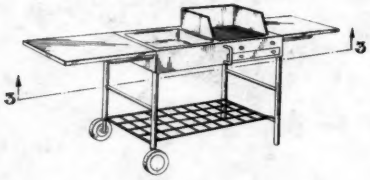


285,520
VACUUM JUG
Morgan Ferm, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden
Filed Jun. 18, 1984, Ser. No. 621,605
Claims priority, application Sweden, Dec. 22, 1983, 3388/83
Term of patent 14 years
U.S. Cl. D7—321

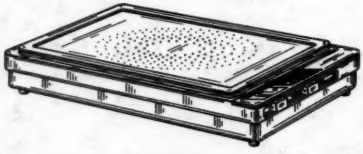


285,521
COFFEE POT
Joy C. Urich, New York, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed May 18, 1984, Ser. No. 612,070
Term of patent 14 years
U.S. Cl. D7—321

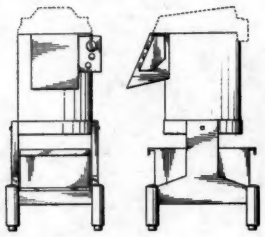
285,522
PORTABLE COLLAPSIBLE COMBINATION SINK AND STOVE
Ronald J. Basini, 932 Ideal Way, Charlotte, N.C. 28203
Filed Dec. 19, 1983, Ser. No. 562,719
Term of patent 14 years
U.S. Cl. D7—334



285,523
ELECTRO-MAGNETIC INDUCTION HEATER
Isao Ayukawa; Hiroshi Fujii; Masakazu Sugiyama, and Wataru Iwahashi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 23, 1983, Ser. No. 469,085
Claims priority, application Japan, Aug. 23, 1982, 57-38313
Term of patent 14 years
U.S. Cl. D7—367

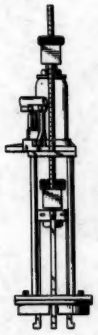


285,524
PRODUCE PEELING MACHINE
Olivier H. C. Prevot, Aubusson, France, assignor to Dito-Sama, Aubusson, France
Filed Jun. 10, 1983, Ser. No. 503,293
Term of patent 14 years
U.S. Cl. D7—372



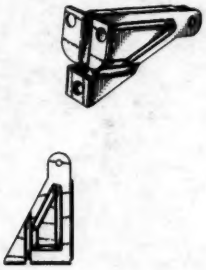
285,525
SHANK FOR A HANDLE TOOL
Victor Zacuto, 5705 Bevis, Van Nuys, Calif. 91411
Filed Apr. 27, 1984, Ser. No. 604,500
Term of patent 14 years
U.S. Cl. D8—10

285,526
MARINE ENGINE REPAIR TOOL
John F. Ribakusky, 60 Mt. View Ave., Mt. Arlington, N.J. 07856
Filed Aug. 30, 1983, Ser. No. 527,942
Term of patent 14 years
U.S. Cl. D8—51

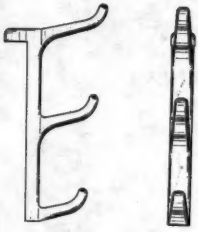


285,527
CUTTING, CRIMPING AND STRIPPING TOOL
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Jul. 3, 1984, Ser. No. 625,741
Term of patent 14 years
U.S. Cl. D8—105

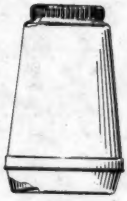
285,528
JAMB BRACKET
Louis D. Huot, Vadnais Heights, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed Apr. 24, 1984, Ser. No. 603,517
Term of patent 14 years
U.S. Cl. D8—330



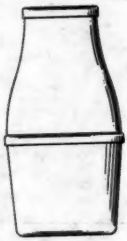
285,529
UTILITY HOOK
Phillip W. Huxhold, and Marilynn A. Huxhold, both of R. 4, Townsend Rd., Janesville, Wis. 53545
Filed Feb. 8, 1984, Ser. No. 578,273
Term of patent 14 years
U.S. Cl. D8—372



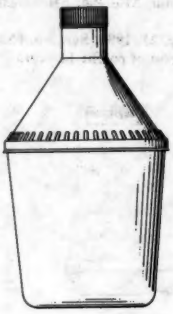
285,530
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Sep. 21, 1984, Ser. No. 652,696
Term of patent 14 years
U.S. Cl. D9—350



285,531
PACKAGING CONTAINER
Bertel R. Peterson, San Juan Capistrano, and Vincent E. Fortuna, Huntington Beach, both of Calif., assignors to Vercon, Inc., Dallas, Tex.
Filed Sep. 20, 1984, Ser. No. 652,543
Term of patent 14 years
U.S. Cl. D9—352



285,532
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Oct. 15, 1984, Ser. No. 660,627
Term of patent 14 years
U.S. Cl. D9—352

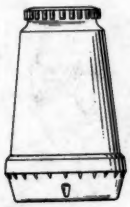


285,533
BOTTLE
Andrew J. Berish, Tuxedo Park, N.Y., and Thomas J. Kokoska, Oakland, N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Mar. 12, 1984, Ser. No. 588,273
Term of patent 14 years
U.S. Cl. D9—352

285,534
CAN
Senji Itoh, Ayase; Fumio Ikushima, and Kiyonori Kogashiwa, both of Yokohama, all of Japan, assignors to Toyoseikan Kaisha Limited, Tokyo, Japan
Filed Oct. 7, 1983, Ser. No. 539,771
Term of patent 14 years
U.S. Cl. D9—365

285,535
BOTTLE OR THE LIKE
John F. Buchholz, Boston, and Henry J. Rahn, Sharon, both of Mass., assignors to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 531,161, Sep. 9, 1983. This application Aug. 5, 1985, Ser. No. 762,687
Term of patent 14 years
U.S. Cl. D9—367

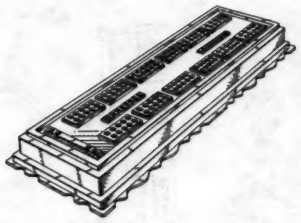
285,536
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Dec. 3, 1984, Ser. No. 677,460
Term of patent 14 years
U.S. Cl. D9—398



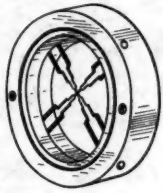
285,537
BOTTLE
James Parker, 245 Fourth St., Dunellen, N.J. 08812
Filed Jul. 7, 1983, Ser. No. 511,700
Term of patent 14 years
U.S. Cl. D9—400

285,538
DISPENSING CONTAINER
Håkan Trumstedt, Dyarnevägen 5, S-198 00 Bålsta, Sweden
Filed Nov. 25, 1983, Ser. No. 554,927
Claims priority, application Sweden, May 27, 1983, 1983-1486
Term of patent 14 years
U.S. Cl. D9—408

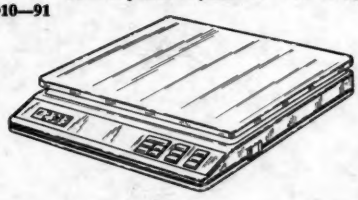
285,539
CRIBBAGE BOARD
Stanley J. Fudro, 2322 NE. 2nd St., Minneapolis, Minn. 55418
Filed Jan. 20, 1984, Ser. No. 572,629
Term of patent 14 years
U.S. Cl. D10—46.1



285,540
TRANSIT RETICLE OR SIMILAR ARTICLE
Frank L. Allen, Montclair, N.J., assignor to Algate Instrument Corporation, Montclair, N.J.
Filed Aug. 8, 1983, Ser. No. 521,046
Term of patent 14 years
U.S. Cl. D10—74



285,541
SCALE
Marten F. Elkerbout, Peize, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 26, 1984, Ser. No. 593,148
Claims priority, application Hague, Oct. 3, 1983, 58306-00
Term of patent 14 years
U.S. Cl. D10—91

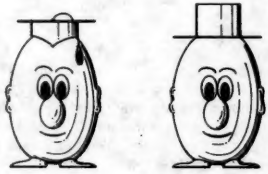


285,542
REMOTE CONTROLLER FOR MOBILE SECURITY SYSTEM
Fumio Tanaka, Tokyo, and Akio Yamaguchi, Iwaki, both of Japan, assignors to Alpine Electronics, Inc., Tokyo, Japan
Filed Aug. 17, 1984, Ser. No. 641,975
Term of patent 14 years
U.S. Cl. D10—106

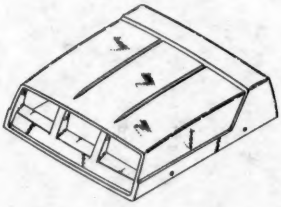
285,543
WATCHCASE-BRACELET
Andreas Moser, Ruttenen, Switzerland, assignor to Alfex S.A., Viganello, Switzerland
Filed Jul. 3, 1985, Ser. No. 751,514
Claims priority, application Switzerland, Jan. 4, 1985, 114206
Term of patent 14 years
U.S. Cl. D11—4

285,544
RING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation Limited, Vaduz, Liechtenstein
Filed Sep. 24, 1982, Ser. No. 422,674
Claims priority, application Italy, Jul. 30, 1982, 35960/82[U]
Term of patent 14 years
U.S. Cl. D11—34

285,545
FIGURINE
Lori L. Crouch, North Palm Beach, Fla., assignor to Lori Lee Productions, Inc., Palm Beach, Fla.
Filed Jun. 6, 1983, Ser. No. 501,449
Term of patent 14 years
U.S. Cl. D11—160

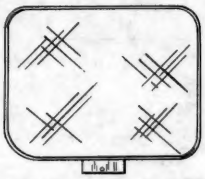


285,546
PROTECTIVE COVER FOR VEHICLE ROOF VENT
Ronald P. Hayslette, Huntington Beach, Calif., assignor to Jensen General Corp., Los Angeles, Calif.
Filed Oct. 27, 1983, Ser. No. 546,039
Term of patent 14 years
U.S. Cl. D12—155

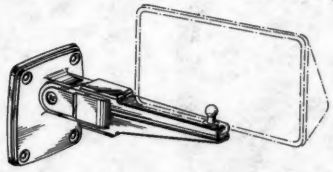


285,547
REAR VIEW MIRROR
Young S. Kim, 3137 Monticello Dr., Falls Church, Va. 22042
Filed Apr. 12, 1984, Ser. No. 599,630
Term of patent 14 years
U.S. Cl. D12—187

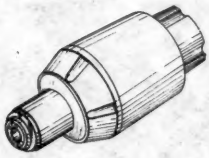
285,548
VEHICLE SAFETY MIRROR
John F. Brown, 611 Dell St., Solana Beach, Calif. 92075, and Robert L. Kottke, 1019 Genie La., Cardiff-by-the-Sea, Calif. 92007
Continuation-in-part of Ser. No. 373,397, Apr. 30, 1982, abandoned. This application Sep. 14, 1984, Ser. No. 650,685
Term of patent 14 years
U.S. Cl. D12—187



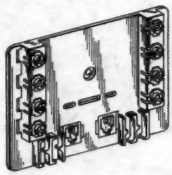
285,549
ADJUSTABLE AUTOMOTIVE MIRROR SUPPORT
Ernesto R. Haack, Buena Park, Calif., assignor to Orion Industries, Inc., Compton, Calif.
Filed Sep. 17, 1984, Ser. No. 651,524
Term of patent 14 years
U.S. Cl. D12—187



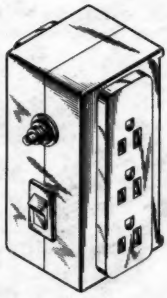
285,550
HIGH-VOLTAGE CONTROL MODULE
William R. Panas, Glenview, Ill., assignor to S&C Electric Company, Chicago, Ill.
Filed Feb. 11, 1983, Ser. No. 465,713
Term of patent 14 years
U.S. Cl. D13—24



285,551
TELEPHONE NETWORK INTERFACE PANEL
Daniel Meyer, Hector, Minn., assignor to Communications Systems, Inc., Hector, Minn.
Filed Nov. 17, 1983, Ser. No. 552,785
Term of patent 14 years
U.S. Cl. D13—24



285,552
SIX OUTLET SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Oct. 25, 1983, Ser. No. 543,815
Term of patent 14 years
U.S. Cl. D13—30



285,553

**TELEPHONE SET WITH AUTOMATIC DIALER AND SPEAKER PHONE**

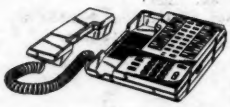
Haruo Baba, Kanagawa; Teisuke Kurosu, Tokyo; Fumiharu Ohta, Kanagawa; Kazumasa Takenaka, Kanagawa, and Satoshi Watanabe, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1984, Ser. No. 573,747

Claims priority, application Japan, Aug. 12, 1983, 58-35622

Term of patent 14 years

U.S. Cl. D14—52



285,554

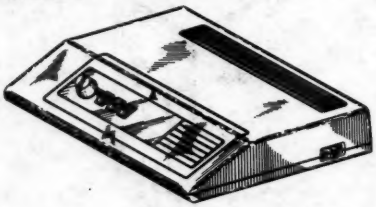
**CONTROL UNIT OR SIMILAR ARTICLE FOR INTERCONNECTING RADIO AND TELEPHONE SETS**

Thomas G. Beaumont, Beford, and Masaru Tokiyama, Arlington, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1984, Ser. No. 598,760

Term of patent 14 years

U.S. Cl. D14—52



285,555

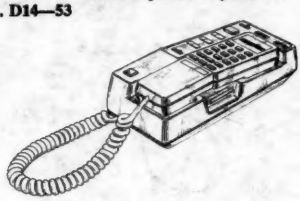
**TELEPHONE FOR AUTOMOBILES**

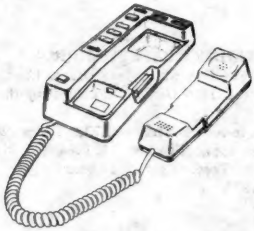
Yoshifumi Fukutani, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 7, 1984, Ser. No. 587,289

Term of patent 14 years

U.S. Cl. D14—53





285,556

**TELEPHONE**

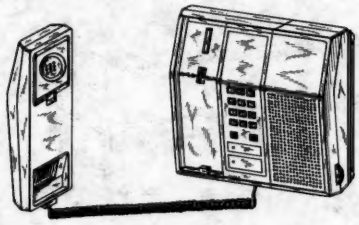
Raymond Ling, Hong Kong, Hong Kong, assignor to North American Technical Services (H.K.) Ltd., Hong Kong, Hong Kong

Filed Jun. 21, 1984, Ser. No. 623,148

Term of patent 14 years

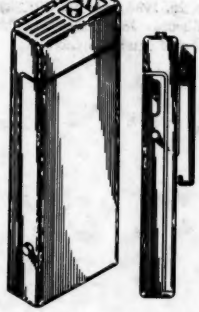
U.S. Cl. D14—53

285,557
SPEAKER TELEPHONE SET
John J. Bocko, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.
Filed Feb. 29, 1984, Ser. No. 582,651
Term of patent 14 years
U.S. Cl. D14—56

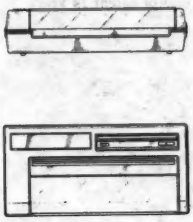


285,558
TELEPHONE SET REMOTE ACCESSORY STAND
Robert B. Isaacs, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 5, 1984, Ser. No. 586,446
Term of patent 14 years
U.S. Cl. D14—59

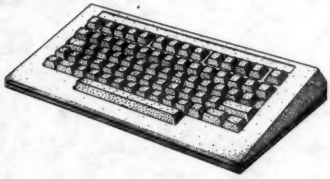
285,559
RADIO PAGER OR SIMILAR ARTICLE
Richard J. Toth, Boca Raton; Donald K. Krumin, Ft. Lauderdale, both of Fla., and John A. Eckmann, Baldwinsville, N.Y., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 7, 1983, Ser. No. 559,073
Term of patent 14 years
U.S. Cl. D14—68



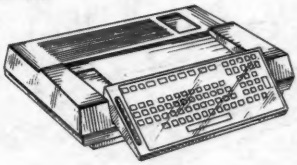
285,560
FACSIMILE DEVICE
Kenji Hoshino, Tokorozawa, Japan, assignor to Data East Corporation, Tokyo, Japan
Filed Feb. 17, 1984, Ser. No. 581,392
Claims priority, application Japan, Aug. 19, 1983, 58-36143
Term of patent 14 years
U.S. Cl. D14—94



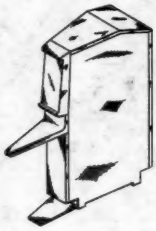
285,561
KEYBOARD
Henry J. Mack, Levittown; John N. McGarvey, Drexel Hill, both of Pa.; Terrance J. Paas; Terry B. Prince, both of Indianapolis, Ind., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Information Systems Inc., Morristown, N.J.
Filed Oct. 11, 1985, Ser. No. 786,451
Term of patent 14 years
U.S. Cl. D14—100



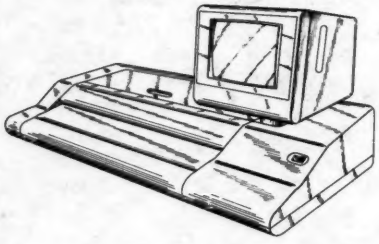
285,562
INFORMATION SYSTEM TERMINAL OR THE LIKE
John F. Graham, Sudbury, and Daniel L. Williams, Norwood, both of Mass., assignors to Keycom Electronic Publishing, Schaumburg, Ill.
Filed Oct. 25, 1983, Ser. No. 545,614
Term of patent 14 years
U.S. Cl. D14—100



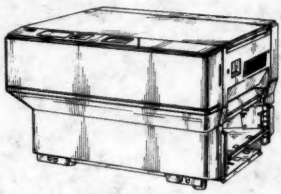
285,563
WEDGE SHAPED CONSOLE FOR DATA PROCESSING CONSOLE GROUPING
Raymond Golden, Willowick, and George S. Whaley, Eastlake, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 19, 1983, Ser. No. 533,085
The portion of the term of this patent subsequent to Aug. 19, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—103



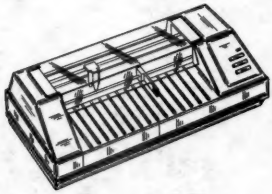
285,564
COMBINED DOCUMENT SCANNER AND MONITOR UNIT
Ernest Bevilacqua, Wilton, Conn., and William Pferd, III, Mendham, N.J., assignors to Skantek Corporation, Warren, N.J.
Filed Jan. 27, 1984, Ser. No. 574,318
Term of patent 14 years
U.S. Cl. D14—106



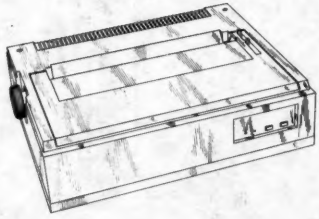
285,565
PRINTER FOR ELECTRONIC COMPUTERS
Kunio Hara, Chiba, and Shigeru Sutoh, Urawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Mar. 16, 1984, Ser. No. 590,229
Term of patent 14 years
U.S. Cl. D14—111



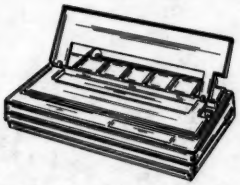
285,566
PRINTER
Shigeaki Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 19, 1984, Ser. No. 601,990
Claims priority, application Japan, Oct. 20, 1983, 58-45832
Term of patent 14 years
U.S. Cl. D14—111



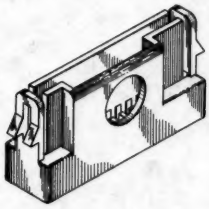
285,567
OUTPUT PRINTER FOR ELECTRONIC COMPUTER
Tamada Kenji, Tokyo, and Nagashima Yoshimitsu, Saitama, both of Japan, assignors to Silver Seiko Limited, Japan
Filed Apr. 25, 1984, Ser. No. 603,587
Claims priority, application Japan, Oct. 27, 1983, 58-46709
Term of patent 14 years
U.S. Cl. D14—111



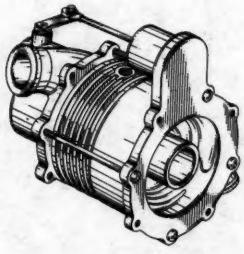
285,568
PRINTER
Masakazu Sugiyama, and Atsuhiko Tokunaga, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 27, 1984, Ser. No. 593,734
Claims priority, application Japan, Sep. 29, 1983, 58-42764
Term of patent 14 years
U.S. Cl. D14—111



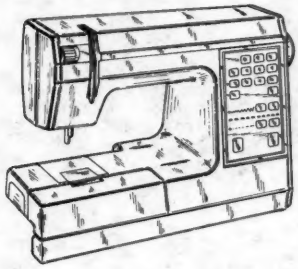
285,569
HOUSING FOR COMPUTER TERMINAL MEMORY MODULE
Christopher J. Reitz, Davie, Fla., and Jeffrey C. Barrus, Houston, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 14, 1984, Ser. No. 589,292
Term of patent 14 years
U.S. Cl. D14—114



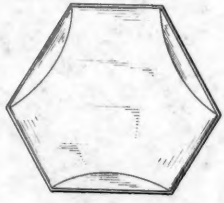
285,570
TURBOCHARGER
Charles E. McInerney, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed May 26, 1983, Ser. No. 498,227
Term of patent 14 years
U.S. Cl. D15—5



285,571
SEWING MACHINE
Yoshiaki Eguchi, and Koji Uchida, both of Higashimurayama, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Aug. 12, 1983, Ser. No. 522,843
Claims priority, application Japan, Mar. 12, 1983, 58-9976
Term of patent 14 years
U.S. Cl. D15—69



285,572
ELECTRONIC DRUM
Yoshiki Hoshino, Aichi, Japan, assignor to Hoshino Gakki Co., Ltd., Japan
Filed Oct. 2, 1984, Ser. No. 656,956
Claims priority, application Japan, Apr. 2, 1984, 59-013060
Term of patent 14 years
U.S. Cl. D17—22

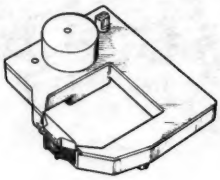


285,573
CASH-REGISTER TERMINAL
Daniel Lefeuvre, Montigny Le Bretonneux, France, assignor to Electronique Serge Dassault, Paris, France
Filed Jul. 19, 1984, Ser. No. 632,345
Claims priority, application France, May 23, 1984, 842275
Term of patent 14 years
U.S. Cl. D18—4

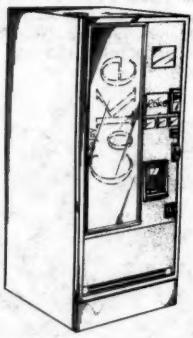
285,574
ELECTRONIC CALCULATOR
Atsuhiko Tokunaga, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 29, 1984, Ser. No. 676,078
Claims priority, application Japan, Jun. 5, 1984, 59-23162
Term of patent 14 years
U.S. Cl. D18—7

285,575
ELECTRONIC CALCULATOR WITH PRINTER
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 19, 1984, Ser. No. 672,917
Claims priority, application Japan, May 30, 1984, 59-22505
Term of patent 14 years
U.S. Cl. D18—7

285,576
PRINTER RIBBON CARTRIDGE
Richard E. LaSpesa, Chicago, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.
Filed Aug. 29, 1984, Ser. No. 645,368
Term of patent 14 years
U.S. Cl. D18—22

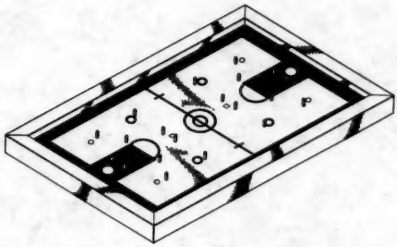


285,577
COIN OPERATED CUP VENDING MACHINE
James R. Bristow, Marietta, and Joaquin R. Davila, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Sep. 15, 1983, Ser. No. 532,559
Term of patent 14 years
U.S. Cl. D20—4



285,578
BULLETIN BOARD
William M. Habermehl, Box 19654, Dept. 161, Irvine, Calif. 92715
Filed Jan. 16, 1984, Ser. No. 571,331
Term of patent 14 years
U.S. Cl. D20—42

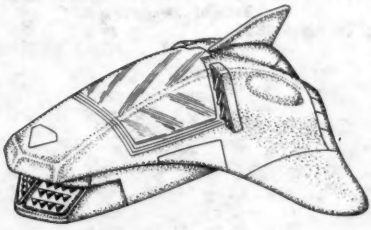
285,579
GAMEBOARD
James D. Hill, 6018 Innes Trace, Louisville, Ky. 40222
Filed Apr. 23, 1984, Ser. No. 602,912
Term of patent 14 years
U.S. Cl. D21—18



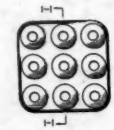
285,580
TOY BASEBALL BATTER
Peter A. Adolph, 5 Arundel House, Clarence Road, Tunbridge Wells, Kent TN1 1HG, England
Filed Feb. 15, 1984, Ser. No. 580,217
Term of patent 14 years
U.S. Cl. D21—51

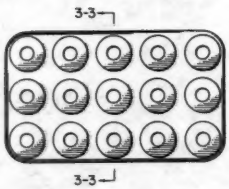
285,581
TOY BASEBALL PITCHER
Peter A. Adolph, 5 Arundel House, Clarence Road, Tunbridge Wells, Kent TN1 1HG, England
Filed Feb. 15, 1984, Ser. No. 580,219
Term of patent 14 years
U.S. Cl. D21—51

285,582
TOY AIRCRAFT
W. Grey Williams, Cincinnati, Ohio, and Peter Crosson, San Pedro, Calif., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Mar. 2, 1984, Ser. No. 585,707
Term of patent 14 years
U.S. Cl. D21—87



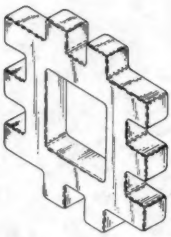
285,583
CONSTRUCTION TOY
Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 508,514, Jun. 28, 1983. This application Sep. 30, 1985, Ser. No. 781,737
Claims priority, application Japan, Dec. 29, 1982, SHO-57-58161
Term of patent 14 years
U.S. Cl. D21—108



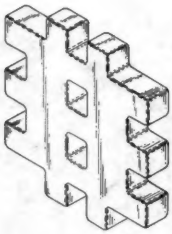



285,584
CONSTRUCTION TOY
Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 508,514, Jun. 28, 1983. This application Sep. 30, 1985, Ser. No. 781,730
Claims priority, application Japan, Dec. 29, 1982, 57-58161
Term of patent 14 years
U.S. Cl. D21—108

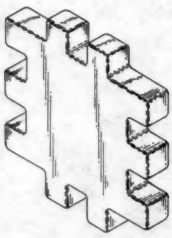
285,585
TOY CONSTRUCTION PIECE
Thomas G. Murdough, Jr., Hudson, and J. Timothy Smith, Stow, both of Ohio, assignors to Little Tikes Company, Hudson, Ohio
Filed Dec. 17, 1984, Ser. No. 682,636
Term of patent 14 years
U.S. Cl. D21—108



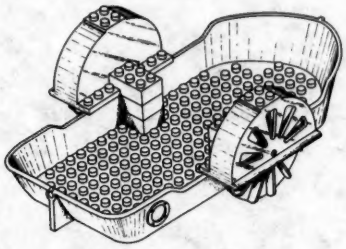
285,586
TOY CONSTRUCTION PIECE
Thomas G. Murdough, Jr., Hudson, and J. Timothy Smith, Stow, both of Ohio, assignors to Little Tikes Company, Hudson, Ohio
Filed Dec. 17, 1984, Ser. No. 682,635
Term of patent 14 years
U.S. Cl. D21—108



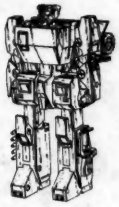
285,587
TOY CONSTRUCTION PIECE
Thomas G. Murdough, Jr., 161 Aurora St., Hudson, Ohio 44236, and J. Timothy Smith, 3794 Kent Rd., Stow, Ohio 44224
Filed Dec. 17, 1984, Ser. No. 682,638
Term of patent 14 years
U.S. Cl. D21—108

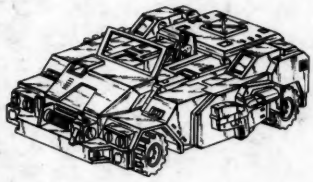


285,588
TOY CONSTRUCTION BOAT
Philip M. Kushner, Greve Strand, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 30, 1984, Ser. No. 676,536
Term of patent 14 years
U.S. Cl. D21—130



285,589
CHANGEABLE ROBOT TOY
Yukimitsu Matsushiro, Tokyo, Japan, assignor to Kabushiki Kaisha Matsushiro, Japan
Filed May 1, 1984, Ser. No. 606,841
Term of patent 14 years
U.S. Cl. D21—150

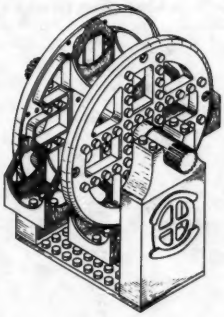




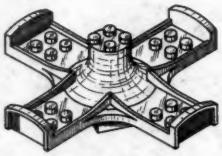
285,590
DOLL
Tracy Fletcher, Gretna, La., assignor to Pillow Pal, Inc., Harvey, La.
Filed Mar. 5, 1984, Ser. No. 586,244
Term of patent 14 years
U.S. Cl. D21—166

285,591
BALL
Simon J. Peel, Huddersfield, England, assignor to Benjamin Crook & Sons Limited, Huddersfield, England
Filed Jan. 16, 1984, Ser. No. 571,313
Claims priority, application United Kingdom, Jul. 20, 1983, 1 014 218; Dec. 2, 1983, 1 016 651
Term of patent 14 years
U.S. Cl. D21—205

285,592
TOY CONSTRUCTION FERRIS WHEEL
Philip M. Kushner, Greve Strand, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 30, 1984, Ser. No. 676,655
Term of patent 14 years
U.S. Cl. D21—248

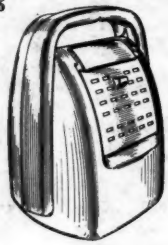


285,593
TOY CONSTRUCTION ROUNDABOUT
Henrik Host, Roskilde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 30, 1984, Ser. No. 676,579
Term of patent 14 years
U.S. Cl. D21—249

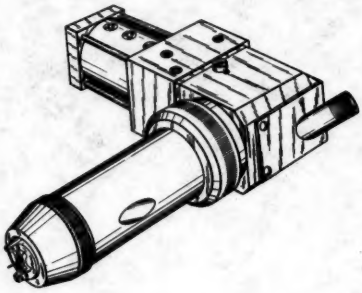


285,594
SPACE AMUSEMENT RIDE
Mark S. Sassak, 2405 Arenas, Las Vegas, Nev. 89102
Filed Feb. 10, 1984, Ser. No. 579,129
Term of patent 14 years
U.S. Cl. D21—250

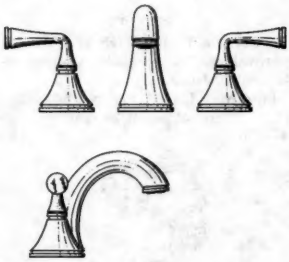
285,595
MINNOW BUCKET
Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Corporation, Baraboo, Wis.
Filed Oct. 28, 1983, Ser. No. 546,520
Term of patent 14 years
U.S. Cl. D22—136



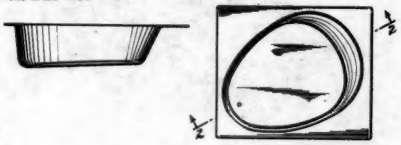
285,596
ROBOT MOUNTED SPRAY GUN
James J. Gimple, Oregon, and Charles T. Lasley, Toledo, both of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Jan. 9, 1984, Ser. No. 569,336
Term of patent 14 years
U.S. Cl. D23—17



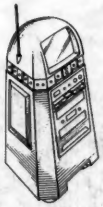
285,597
FAUCET SET
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Apr. 2, 1984, Ser. No. 595,651
Term of patent 14 years
U.S. Cl. D23—25



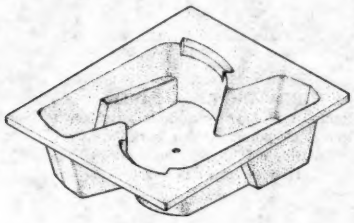
285,598
SUNKEN TUB
Gary M. McKeel, Nashville, Tenn., assignor to Aquarius Industries, Inc., Nashville, Tenn.
Filed Jun. 11, 1984, Ser. No. 619,128
Term of patent 14 years
U.S. Cl. D23—55



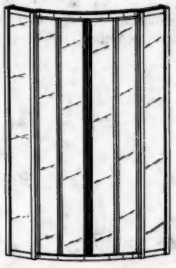
285,599
ROBOT
Michael N. Forino, Carlsbad, Calif., assignor to Hubotics, Inc., Carlsbad, Calif.
Filed Feb. 6, 1984, Ser. No. 577,238
Term of patent 14 years
U.S. Cl. D21—150



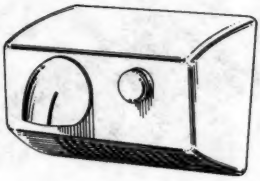
285,600
BATHTUB
Alan L. Steinhardt, 10200-6 Larwin Ave., Chatsworth, Calif. 91304
Filed Jun. 25, 1984, Ser. No. 623,849
Term of patent 14 years
U.S. Cl. D23—55



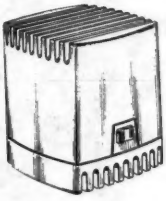
285,601
SLIDING SHOWER DOOR
Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hueriach/-Thun, Switzerland
Filed Sep. 16, 1983, Ser. No. 532,764
Claims priority, application Hague, Mar. 21, 1983 DM/002-342
Term of patent 14 years
U.S. Cl. D23—69



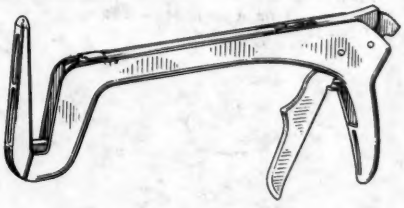
285,602
CASING FOR HOT AIR HAND DRYER
Kell Warshaw, and Paul Deutchman, both of Montreal, Canada, assignors to Avmor Ltd., Montreal, Canada
Filed Mar. 14, 1984, Ser. No. 589,333
Term of patent 14 years
U.S. Cl. D23—74



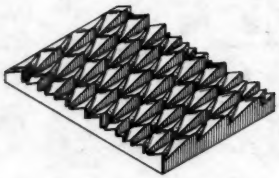
285,603
AIR PURIFYING APPARATUS
Paolo Martin, Gassino Torinese, Italy, assignor to Mediana S.A., Geneva, Switzerland
Filed Apr. 5, 1984, Ser. No. 596,925
Term of patent 14 years
U.S. Cl. D23—150



285,604
LINEAR SURGICAL STAPLER WITH PERMANENT ANVIL
Herbert W. Korthoff, Wilton, and Thomas Tompkins, Trumbull, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,432
The portion of the term of this patent subsequent to Jan. 17, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—26

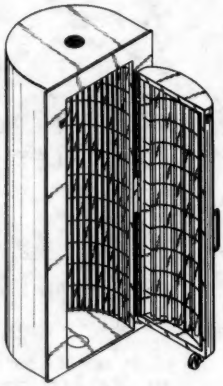


285,605
SURGICAL RASP INSERT
John A. Davison, and Robert J. Kellar, both of San Jose, Calif., assignors to Adler Instrument Company, Norcross, Ga.
Filed Sep. 28, 1983, Ser. No. 536,610
Term of patent 14 years
U.S. Cl. D24—28



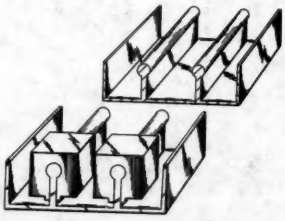
285,606
HOUSING FOR A MEDICAL DISK FILTER
Kjell H. I. Christopherson, Staffanstorp, Sweden, assignor to Gambro Lundia AB, Sweden
Filed May 9, 1983, Ser. No. 493,009
Claims priority, application Sweden, Nov. 19, 1982, 2781/82; Nov. 19, 1982, 2782/82
Term of patent 14 years
U.S. Cl. D24—34

285,607
TANNING BOOTH
William C. Macier, 290 Church St., Saratoga Springs, N.Y. 12866
Filed Jan. 20, 1984, Ser. No. 572,530
Term of patent 14 years
U.S. Cl. D24—39

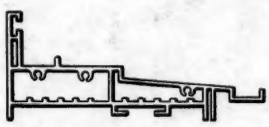


285,608
VIBRATING BED BOARD
Howard L. Rauch, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 1, 1983, Ser. No. 509,618
Term of patent 14 years
U.S. Cl. D24—40

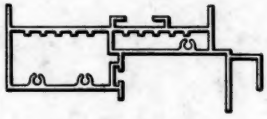
285,609
SUSPENSION RAIL WITH SLIDING BLOCK
Per-Olof Santesson, Ljungbyvagen 91, Halmstad, Sweden
Filed Apr. 26, 1983, Ser. No. 488,789
Claims priority, application Sweden, Oct. 28, 1982, 82-2571
Term of patent 14 years
U.S. Cl. D25—60



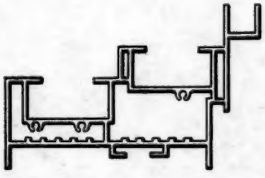
285,610
WINDOW SILL EXTRUSION
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Inc., Wilmington, Del.
Filed Jan. 16, 1984, Ser. No. 570,859
Term of patent 14 years
U.S. Cl. D25—74



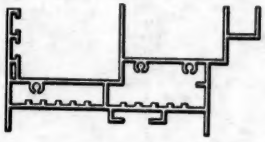
285,611
WINDOW HEADER EXTRUSION
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Inc., Wilmington, Del.
Filed Jan. 16, 1984, Ser. No. 571,076
Term of patent 14 years
U.S. Cl. D25—74



285,612
WINDOW SIDE FRAME EXTRUSION
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Inc., Wilmington, Del.
Filed Jan. 16, 1984, Ser. No. 571,077
Term of patent 14 years
U.S. Cl. D25—74

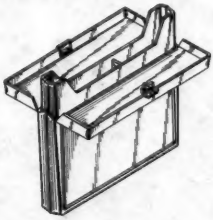


285,613
WINDOW SIDE FRAME EXTRUSION
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Inc., Wilmington, Del.
Filed Mar. 16, 1984, Ser. No. 590,480
Term of patent 14 years
U.S. Cl. D25—74

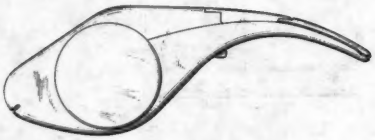


285,614
OIL LAMP ASSEMBLY
Willy Vanbragt, 544 Weddel, #7, Sunnyvale, Calif. 94086
Filed Jul. 13, 1983, Ser. No. 513,460
Term of patent 14 years
U.S. Cl. D26—11

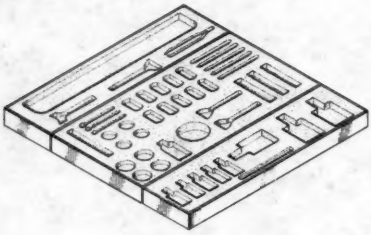
285,615
CASE FOR TOBACCO PRODUCTS
Christian Burger, Burg, Switzerland, assignor to Burger Söhne AG Burg, Burg, Switzerland
Filed Oct. 31, 1983, Ser. No. 547,415
Claims priority, application Switzerland, Jun. 10, 1983, 113099
Term of patent 14 years
U.S. Cl. D27—47



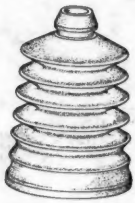
285,616
DENTAL FLOSSER
George Beggs, 1740 Spruce La., and Thomas H. Richardson, 610 Southerncross Dr., both of Colorado Springs, Colo. 80906
Filed Nov. 4, 1983, Ser. No. 549,194
Term of patent 14 years
U.S. Cl. D28—64



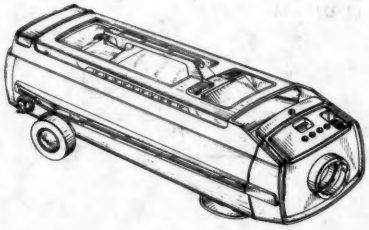
285,617
COSMETICS CASE
Steven R. Stillwagon, 1541 18th St., Manhattan Beach, Calif. 90266
Filed Jun. 18, 1984, Ser. No. 621,952
Term of patent 14 years
U.S. Cl. D28—83



285,618
VACUUM CUP FOR ARTICLE LIFTING MACHINE
Bradley N. Borgman, Riverside, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.
Filed Jan. 12, 1984, Ser. No. 570,266
Term of patent 14 years
U.S. Cl. D32—4



285,619
VACUUM CLEANER
Willard C. Nado, Trumbull; George L. Schick, Easton; John S. Tarnowski, Wilton, and Frederick M. Kipp, Fairfield, all of Conn., assignors to Electrolux Corporation, Stamford, Conn.
Filed Sep. 12, 1984, Ser. No. 649,897
Term of patent 14 years
U.S. Cl. D32—21



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 9TH DAY OF SEPTEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Lo, Young S.; and Cale, Albert D., Jr., 4,610,819, Cl. 540-488.000.

A. Nattermann & Cie GmbH: *See*—
Lautenschlager, Hans-Heiner; Graf, Erich; and Leyck, Sigurd, 4,610,979, Cl. 514-77.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Regent, Robert M., 4,610,376, Cl. 222-185.000.

A/S Hydraulik Brattvag: *See*—
Roed, Harald, 4,610,365, Cl. 212-262.000.

AB Asea-Atom: *See*—
Vannesjo, Katarina L., 4,610,842, Cl. 376-416.000.

Abbott Laboratories: *See*—
Davis, Charles L., 4,610,142, Cl. 62-3.000.
Knox, Kenneth H.; and Larkin, Mark E., 4,610,684, Cl. 604-416.000.

Abe, Fuminori: *See*—
Nakayama, Yoshio; Abe, Fuminori; and Nagasawa, Naofumi, 4,611,135, Cl. 307-572.000.

Abe, Katsuo: *See*—
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.

Abe, Masahiro; Miyagawa, Masafumi; Nakamura, Hatsuo; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of dicing a semiconductor wafer. 4,610,079, Cl. 29-583.000.

Abe, Ryozo: *See*—
Honjo, Yoshihiko; Yamada, Hisayoshi; Hosono, Kazuhiro; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,611,248, Cl. 358-342.000.

Abe, Seiko: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Natsuyama, Yukihiro, 4,610,427, Cl. 251-129.060.

Abe, Susumu: *See*—
Ogawa, Masahiro; and Abe, Susumu, 4,610,857, Cl. 423-335.000.

Abe, Tomohiro: *See*—
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, 4,610,859, Cl. 423-347.000.

Abom, Jan J. V. Device for ignition of the powder in powder engines and powder-operated turbine engines. 4,610,136, Cl. 60-39.464.

Acker, Richard C., to Teledyne Industries, Inc. Pilot-operated valve with integral filter. 4,610,270, Cl. 137-549.000.

Ackermann, Peter; and Gsell, Laurenz, to Ciba-Geigy Corporation. 3-phenoxybenzyl-(2-phenyl-2,2-alkylene-ethyl) ethers and -thioethers, and their use for controlling pests. 4,611,004, Cl. 514-464.000.

Adams, Peter D.: *See*—
Parker, Francis F., 4,610,179, Cl. 74-335.000.

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Jensen, James W., 4,610,739, Cl. 156-64.000.

Adolphi, Heinrich: *See*—
Schwarz, Gerd-Ulrich; Theobald, Hans; and Adolphi, Heinrich, 4,611,010, Cl. 514-521.000.

Advanced Controls, Inc.: *See*—
Hockersmith, Thomas F.; and Wile, Donald E., 4,610,595, Cl. 414-222.000.

Advanced Micro Devices, Inc.: *See*—
Chuang, Patrick T.; Maltiel, Ron; and Yau, Robert L., 4,611,309, Cl. 365-185.000.

Advanced Semiconductor Materials of America, Inc.: *See*—
Engle, George M.; and Rosler, Richard S., 4,610,748, Cl. 156-345.000.

Aeplc: *See*—
Baigent, Maurice G., 4,610,486, Cl. 384-7.000.

Aeroquip Corporation: *See*—
Geer, Linda L.; and Knowles, Steven M., 4,610,466, Cl. 285-12.000.
Perrine, Neill D.; and Fournier, Paul J. E., 4,610,470, Cl. 285-321.000.

Agence National de Valorisation de la Recherche (ANUAR): *See*—
Leprince, Philippe; Bloyet, Emile; and Marec, Jean, 4,611,108, Cl. 219-121.0PR.

Agfa-Gevaert N.V.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,610,532, Cl. 355-14.00D.
Mampaey, Jozef L.; and Remmerie, Herman J., 4,610,939, Cl. 430-33.000.

Ahler, Wilhelm: *See*—
Krone, Bernard; and Ahler, Wilhelm, 4,610,123, Cl. 53-118.000.

Ahne, Hellmut, to Siemens Aktiengesellschaft. Method and manufacturing polyimidazole and polyimidazopyrrolone relief structures. 4,610,947, Cl. 430-296.000.

Aiba, Shoji: *See*—
Miyamura, Masao; Tsukakoshi, Osamu; Kamata, Yoshio; and Aiba, Shoji, 4,611,121, Cl. 250-423.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Kawai, Taneichi, 4,611,263, Cl. 362-71.000.
Niwa, Shigeo; Sugishita, Junji; and Ishii, Masami, 4,610,693, Cl. 623-16.000.

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Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,336, Cl. 192-4.00A.
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,337, Cl. 192-4.00A.

Aiuchi, Susumu: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.

Aizawa, Yasuo: *See*—
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,610,214, Cl. 114-144.00E.

Ajinomoto Co., Inc.: *See*—
Yukawa, Toshihide; Ikeda, Toru; Kishimoto, Shinichi; and Sugiyama, Katsumi, 4,610,827, Cl. 260-501.110.

Akahoshi, Haruo: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Separable slide fastener. 4,610,057, Cl. 24-433.000.

Akebono Brake Industry Company Ltd.: *See*—
Watanabe, Namio, 4,610,485, Cl. 303-114.000.

Akkapeddi, Murali K.; DeBona, Bruce T.; Li, Hsin L.; and Prevorsek, Dusan C. Process for the production of thermoplastic compositions containing thermotropic oligomers and compositions produced by such process. 4,611,025, Cl. 524-449.000.

Akzo N.V.: *See*—
Henne, Werner; and Dunweg, Gustav, 4,610,791, Cl. 210-490.000.

Albang, Nicholas P.; Lindsay, Gary L.; and Foster, Daniel F., to Phoenix Simpton Company. Curb inlet with removable gutter form. 4,610,566, Cl. 404-4.000.

Albin, William W., to Zenith Electronics Corporation. Projection television set up method and apparatus. 4,611,241, Cl. 358-60.000.

Albrecht, Hans P.; and Kreiskott, Horst, to BASF Aktiengesellschaft. N-acyl derivatives of peptides, their preparation and their use in the treatment of disorders, and agents for this purpose. 4,610,817, Cl. 514-2.000.

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Alexander, Eric A., to Rolls-Royce plc. Combustion equipment for a gas turbine engine. 4,610,135, Cl. 60-39.010.

Alexander, John D.: *See*—
Ghassemi, Farhad; and Alexander, John D., 4,610,301, Cl. 166-245.000.

Alfa-Laval Agri International AB: *See*—
Johannesson, Leif B., 4,610,163, Cl. 73-250.000.

Allan, G. Graham: *See*—
Powell, James C.; and Allan, G. Graham, 4,611,039, Cl. 526-271.000.

Allen, Charles E. Device for attracting deer and elk. 4,610,641, Cl. 446-397.000.

Allied Corporation: *See*—
Hensley, Thomas E., 4,610,080, Cl. 29-602.00R.

Allis-Chalmers Corporation: *See*—
Long, Ray A., 4,610,599, Cl. 415-15.000.

Almeras, Roland: *See*—
Ollivier, Jean; and Almeras, Roland, 4,610,382, Cl. 227-9.000.

Alps Electric Co., Ltd.: *See*—
Nakanowatari, Jun, 4,610,508, Cl. 350-337.000.

Aluminum Company of America: *See*—
Jacoby, John E.; Yu, Ho; and Ramser, Robert A., 4,610,295, Cl. 164-5.000.
Sanders, Robert E., Jr.; and Petit, Jocelyn I., 4,610,733, Cl. 148-12.70A.

ALZA Corporation: *See*—
Ayer, Atul; Theeuwes, Felix; and Wong, Patrick S. L., 4,610,686, Cl. 604-890.000.

Amana Refrigeration, Inc.: *See*—
Maurer, Donald J., 4,610,355, Cl. 206-386.000.

Amano, Atsushi: *See*—
Hattori, Shinichiro; Hosoda, Seiichi; Kanno, Masahide; and Amano, Atsushi, 4,611,271, Cl. 364-184.000.

AMAX Inc.: *See*—
Duyvesteyn, Willem P. C.; and Jha, Mahesh C., 4,610,721, Cl. 75-97.00A.
Duyvesteyn, Willem P. C.; and Hogsett, Robert F., 4,610,722, Cl. 75-97.00A.

Amberg, Robert L.; and Rosenberg, Jerome C., to Boeing Company, The. Deceleration control brake system. 4,610,484, Cl. 303-100.000.

American Assembly Tools, Inc.: *See*—
Ciolli, Donald A., 4,610,339, Cl. 192-48.920.

American Can Company: *See*—
Newsome, David L., 4,610,914, Cl. 428-216.000.

American Cyanamid Company: *See*—
Boop, Donald C.; and Bernady, Karel F., 4,610,822, Cl. 540-316.000.
Marsico, Joseph W., Jr.; and Wright, William B., Jr., 4,610,981, Cl. 514-158.000.

American Home Products Corporation: *See*—
Husbands, G. E. Morris; Yardley, John P.; and Muth, Eric A., 4,611,078, Cl. 558-410.000.

Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, to Coleco Industries, Inc. Glove puppet figure assembly with articulated head components. 4,610,640, Cl. 446-329.000.

Amling, Friedel: *See*—
Koppers, Manfred; Bohnes, Karlheinz; Guse, Kuno; and Amling, Friedel, 4,610,424, Cl. 251-121.000.

Amoco Corporation: *See*—
Clark, David J.; and Fahlen, Theodore S., 4,611,327, Cl. 372-58.000.
Mossman, Allen B., 4,611,084, Cl. 568-630.000.
Patterson, Gregory A.; and Good, Melvin S., 4,610,370, Cl. 220-207.000.
Peters, Edwin F., 4,610,574, Cl. 4u6-50.000.

Amos, James R.; Greathouse, Chester K.; and Riddle, David S., to Stanwich Industries, Inc. Roller hold down device. 4,610,582, Cl. 409-163.000.

AMP Incorporated: *See*—
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,611,262, Cl. 361-421.000.
Johnson, Erlon F.; and Richards, Craig D., 4,611,213, Cl. 343-702.000.

Ampad Corporation: *See*—
DaRosa, Adelino B., 4,610,392, Cl. 229-1.50R.

Ampex Corporation: *See*—
Kudelski, Stefan; and Rosselet, Ernest, 4,611,168, Cl. 324-174.000.
Schiller, Edward, 4,611,259, Cl. 360-125.000.

Ancra Corporation: *See*—
Knox, Howard T., 4,610,055, Cl. 24-68.0CD.

Anderson, Carl R.; and Seaman, Gary G., to AT&T Technologies, Inc. Method and apparatus for inserting leads into holes in substrates. 4,610,084, Cl. 29-834.000.

Anderson, Daniel J., to Molex Incorporated. Automated edge connector assembly. 4,610,082, Cl. 29-741.000.

Anderson, John G.; and Stillwell, Howard R., to Niagara Mohawk Power Corporation. Apparatus for monitoring voltage on a high voltage overhead transmission line. 4,611,207, Cl. 340-870.160.

Anderson, Paul: *See*—
Robson, George; and Anderson, Paul, 4,610,094, Cl. 33-367.000.

Anderson, Rogers H. Function reverse apparatus for powered trailer. 4,610,325, Cl. 180-14.200.

Ando, Mamoru: *See*—
Mitsuyoshi, Takano; and Ando, Mamoru, 4,611,164, Cl. 324-77.00B.

Ando, Manabu, to NEC Corporation. Bootstrap driving circuit. 4,611,134, Cl. 307-482.000.

Andrae, Hans P.: *See*—
Andrae, Wolfhart; Andrae, Hans P.; Beyer, E. H. Erwin; Bayer, Karl; and Lohmann, Manfred, 4,610,431, Cl. 254-93.0HP.

Andrae, Wolfhart; Andrae, Hans P.; Beyer, E. H. Erwin; Bayer, Karl; and Lohmann, Manfred, to SHW Schwabische Huttenwerke GmbH. Adjustable load support. 4,610,431, Cl. 254-93.0HP.

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Fink, Reinhold; and Leuchte, Michael, 4,610,228, Cl. 123-195.00R.
Wissmann, Michael; Nickel, Hans; Fink, Reinhold; and Leuchte, Michael, 4,610,229, Cl. 123-195.00R.

Andresen, Mark E.; Kriz, Thomas A.; and Potemski, Andrew S., to International Business Machines Corporation. DMA asynchronous mode clock stretch. 4,611,279, Cl. 364-200.000.

Anesi, Mario; and Schwarzer, Fred M. Drapery actuating mechanism having dual timer. 4,610,294, Cl. 160-331.000.

Anheuser-Busch Companies, Inc.: *See*—
Teng, James; and Dokos, John H., 4,610,888, Cl. 426-569.000.

Anritsu Electric Company Limited: *See*—
Mitsuyoshi, Takano; and Ando, Mamoru, 4,611,164, Cl. 324-77.00B.

ANT Nachrichtentechnik GmbH: *See*—
Hessenmuller, Horst, 4,611,323, Cl. 370-79.000.

Antrim, Richard L.: *See*—
Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,610,965, Cl. 435-234.000.

Aoki, Harumi: *See*—
Morisawa, Tahei; and Aoki, Harumi, 4,611,243, Cl. 358-225.000.

Aota, Katsumi: *See*—
Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00i².

Appleby, Anthony J., to Electric Power Research Institute. Acid fuel cell. 4,610,938, Cl. 429-42.000.

Appleton Papers Inc.: *See*—
Bodmer, Jerome R.; and Miller, Robert E., 4,610,727, Cl. 106-21.000.

Appropriate Technology Corporation: *See*—
Hausmann, Scott; and McLane, Allan, Jr., 4,610,292, Cl. 160-120.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,610,460, Cl. 280-650.000.

Arai, Hiromichi: *See*—
Seiyama, Tetsuro; Arai, Hiromichi; and Kunisaki, Toshiya, 4,610,867, Cl. 423-635.000.

Arai, Kazutaka: *See*—
Ohara, Yoshio; Arai, Kazutaka; Takahashi, Yasuhiro; and Takakuwa, Yasuo, 4,611,088, Cl. 562-466.000.

Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, to Hitachi, Ltd. Digital data synchronizing circuit. 4,611,335, Cl. 375-110.000.

Araihara, Satoshi, to Fujitsu Limited. Method for fabricating a photomask pattern. 4,610,940, Cl. 430-5.000.

Araki, Shigeyuki: *See*—
Ishikawa, Chuji; and Araki, Shigeyuki, 4,611,216, Cl. 346-75.000.

Arasmith, Stanley D. Curved high absorbancy wood flake. 4,610,928, Cl. 428-402.000.

Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, to Hitachi, Ltd. Method for manufacturing ultra-fine particles. 4,610,718, Cl. 75-0.50C.

Arctic Temperature Controls: *See*—
Stroup, Bert R., 4,610,247, Cl. 128-201.280.

Arizona State University: *See*—
Pettit, George R.; Herald, Cherry L.; and Kamano, Yoskiaki, 4,611,066, Cl. 549-267.000.

Arnold, Don C.; and Wilcox, Thomas J., to Sajar Plastics, Inc. Plumbing connection. 4,610,429, Cl. 251-148.000.

Arnold, Gregory B., to Monarch Marking Systems, Inc. Hand-held labeler. 4,610,752, Cl. 156-540.000.

Arnold, Russell L.: *See*—
Kamuf, Jerry A.; and Arnold, Russell L., 4,611,145, Cl. 313-446.000.

Arnoux, Daniel; Genter, Claude; and Bousquet, Jean, to Societe en Commandite par Actions dite: Chauvin Arnoux. Device for generating an AC ramp for checking the tripping current of a circuit-breaker. 4,611,174, Cl. 324-424.000.

Arora, Guru B., to Eagle Electric Mfg. Co., Inc. Heavy-duty time-delay fuse. 4,611,192, Cl. 337-165.000.

Arzberger, William A.; Riley, Michael J.; LaLumiere, Edward J.; and DeCastro, William H., Jr. Post mix fruit juice dispenser. 4,610,145, Cl. 62-127.000.

Asahi Glass Company Ltd.: *See*—
Asawa, Tatsuro; Miyake, Haruhisa; and Sugaya, Yoshio, 4,610,764, Cl. 204-98.000.

Asahi Kogaku Kogyo K.K.: *See*—
Morisawa, Tahei; and Aoki, Harumi, 4,611,243, Cl. 358-225.000.

Asai, Eiichi: *See*—
Ishida, Masamitsu; Asai, Eiichi; and Higashi, Nobuaki, 4,611,247, Cl. 358-280.000.

Asano, Masamichi: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; and Minagawa, Hidenobu, 4,611,301, Cl. 365-207.000.

Asano, Seiji: *See*—
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, 4,610,522, Cl. 354-173.100.

Asao, Yasuzi: *See*—
Fuchizawa, Tetsuro; Asao, Yasuzi; and Takayanagi, Takashi, 4,610,956, Cl. 430-538.000.

Asawa, Tatsuro; Miyake, Haruhisa; and Sugaya, Yoshio, to Asahi Glass Company Ltd. Electrolytic cation exchange membrane. 4,610,764, Cl. 204-98.000.

ASEA Aktiebolag: *See*—
Eriksson, Erik, 4,610,075, Cl. 29-568.000.
Eriksson, Sven; Halldahl, Lars; and Kohrtz, Sven-Ake, 4,610,893, Cl. 427-34.000.

Aser, Gilbert A., to Xerox Corporation. Reproducing machine. 4,610,526, Cl. 355-3.0BE.

Ashida, Kaneyoshi, to BP Chemicals Limited. Catalysts for the preparation of carbodiimide foams and elastomers. 4,611,013, Cl. 521-105.000.

Aslan, Edward E., to Narda Microwave Corporation, The. Radiation hazard detector. 4,611,166, Cl. 324-95.000.

Asmuth, Richard L.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Stone, Roger E.; and Yuhas, Marjorie P., to AT&T Bell Laboratories. Method for customer definable telephone capability. 4,611,094, Cl. 179-7.1TP.

Asmuth, Richard L.; DiCarlo-Cottone, Melchior J.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Raj-karne, Dattatraya G.; Stone, Roger E.; and Yuhas, Marjorie P., to AT&T Bell Laboratories. Telephone office service assist and handoff. 4,611,096, Cl. 179-18.00B.

Aso, Toshiyuki;: *See*—
Katsube, Hideo; and Aso, Toshiyuki;, 4,610,074, Cl. 29-568.000.

Astner, Gunnar; Wstergren, Orjan; and Thornblom, Jan, to SKF Steel Enginering AB. Method and apparatus for connecting a plasma generator to a reactor. 4,611,110, Cl. 219-121.0PY.

AT&T Bell Laboratories: *See*—
Asmuth, Richard L.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,094, Cl. 179-7.1TP.
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Chevallier, Jacques P.; Dautremont-Smith, William C.; and Tu, Charles W., 4,610,731, Cl. 148-1.500.
Larson, Mikiel L.; and Toy, Wing N., 4,611,322, Cl. 370-60.000.
Linderman, John P., 4,611,280, Cl. 364-300.000.
Netravali, Arun N.; and Segen, Jakub, 4,611,347, Cl. 382-27.000.
Swanson, Eric J., 4,611,130, Cl. 307-355.000.

AT&T Technologies, Inc.: *See*—
Anderson, Carl R.; and Seaman, Gary G., 4,610,084, Cl. 29-834.000.
Haynes, Richard; Ling, Hung C.; and Ng, Sau-Lan L., 4,610,932, Cl. 428-611.000.
Kiersarsky, Albert S.; Sauer, Earl S.; Vesperman, William C.; and Wilson, Max K., 4,610,909, Cl. 428-202.000.

Atlantic Richfield Company: *See*—
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., 4,611,091, Cl. 136-260.000.
Grove, J. Jay; and Mooi, John, 4,610,780, Cl. 208-244.000.
Johnson, Steven W.; and Olsen, Alden W., 4,610,218, Cl. 118-303.000.
Miller, Richard F.; and Blaschke, Marilyn W., 4,611,073, Cl. 556-442.000.

Atlas Fahrzeugtechnik GmbH: *See*—
Brandner, Burkhard, 4,610,426, Cl. 251-129.060.

Atochem: *See*—
Brun, Claude; Cheux, Auguste; and Pelletier, Robert, 4,611,038, Cl. 526-169.200.

Augostini, Carl W., to Xerox Corporation. Stapler having a variable stop member for limiting stapling stroke and staple leg length. 4,610,386, Cl. 227-142.000.

Aurora Konrad G. Schulz GmbH & Co.: *See*—
Kern, Alfred, 4,610,196, Cl. 98-2.000.

Ausikaitis, Joseph P.: *See*—
Miller, William C.; Dunne, Stephen R.; and Ausikaitis, Joseph P., 4,610,700, Cl. 55-35.000.

Austevoll, Wilhelm M. Arrangement for picking up objects or oil from the sea. 4,610,635, Cl. 441-80.000.

Aute Gesellschaft fuer autogene Technik mbH: *See*—
Lotz, Horst K., 4,610,433, Cl. 266-50.000.

Autoflug GmbH: *See*—
Stemmildt, Hans-Joachim; and Nohren, Hubert, 4,610,058, Cl. 24-574.000.

Automatic Handling & Fabrication, Inc.: *See*—
Pienta, David J., 4,610,592, Cl. 414-38.000.

AutoSystems Limited: *See*—
Elliot, Eric, 4,610,361, Cl. 209-555.000.

Avery, William W.: *See*—
Porter, Stanley P.; Williams, John H.; and Avery, William W., 4,610,356, Cl. 206-423.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH, Prof.Dr.Dr.h.c. Hans List: *See*—
Kirchweger, Karl; Knopf, Franz; and Thien, Gerhard, 4,610,326, Cl. 180-68.100.

Ayer, Atul; Theeuwes, Felix; and Wong, Patrick S. L., to ALZA Corporation. Controlled delivery of haloperidol by an osmotic delivery system. 4,610,686, Cl. 604-890.000.

Azerad, Robert: *See*—
D'Angelo, Jean; Revial, Gilbert; Azerad, Robert; and Buisson, Didier, 4,610,826, Cl. 558-44.000.

B&D Designs Inc.: *See*—
Sandler, Ben Z., 4,610,151, Cl. 68-205.00R.

Babcock & Wilcox Company, The: *See*—
Barnes, Christine B., 4,610,263, Cl. 137-85.000.
Masek, Richard C., 4,610,493, Cl. 339-14.00R.

Babish, John G.: *See*—
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,610,993, Cl. 514-335.000.

Babjak, Juraj, to Inco Limited. Process for metal recovery by solvent extraction from $CaSO_4$ containing sulfate solutions. 4,610,861, Cl. 423-157.000.

Bacon, William H.; and O'Toole, Francis S., to Hughes Tool Company. Cable splice method using transition rod. 4,610,737, Cl. 156-49.000.

Baheti, Radhakisan S.; and Corby, Nelson R., Jr., to General Electric Company. Method to determine weld puddle area and width from vision measurements. 4,611,111, Cl. 219-124.340.

Baigent, Maurice G., to Aeplc. Structural bearing assembly. 4,610,486, Cl. 384-7.000.

Bailey, Denis M., to Sterling Drug Inc. Antihypertensive pyridylaminobenzamide compounds. 4,610,991, Cl. 514-318.000.

Baker, Bruce G.; Clark, Neville J.; McArthur, Hamish; and Summerville, Edward, to Flinders University of South Australia, The. Catalysts and methods of their manufacture. 4,610,975, Cl. 502-302.000.

Baker Oil Tools, Inc.: *See*—
Mullins, Albert A., II; Stone, Patrick C.; and Ingram, Gary D., 4,610,300, Cl. 166-134.000.
Nelson, John A.; and Stout, Gregg W., 4,610,312, Cl. 175-4.520.

Baker Perkins Holdings PLC: *See*—
Phillipson, John G., 4,610,346, Cl. 198-425.000.

Ball, Ervin M.; and Hutson, Jack E., to Microlite, Inc. Load responsive inverter for electroluminescent lamp. 4,611,150, Cl. 315-307.000.

Ballard, Larry, to Shakespeare Company. Monofilaments, and fabrics thereof. 4,610,916, Cl. 428-224.000.

Balmer, Clifford J.; and Goddard, Richard, to Vickers Systems S.A. High pressure hydraulic distributor. 4,610,271, Cl. 137-596.130.

Balogh, Bela: *See*—
Czeiler, Andras; Keri, Miklos; Balogh, Bela; Fejes, Erno ; Kallai, Istvan; and Lukacs, Sandor, 4,610,217, Cl. 118-47.000.

Bancroft, G. Michael; Chauvin, William J.; McIntyre, Norman S.; and Metson, J. Bernard. Suppression of molecular ions in secondary ion mass spectra. 4,611,120, Cl. 250-307.000.

Banfi, Claudio, to General Electric Company. Circuit breaker contact arm latch mechanism for eliminating contact bounce. 4,611,187, Cl. 335-16.000.

Banfi, Claudio: *See*—
Pardini, Franco P.; and Banfi, Claudio, 4,611,106, Cl. 200-147.00R.

BankAmerica Corporation: *See*—
Kemppainen, John C.; and Trelford, Thomas E., 4,611,277, Cl. 364-200.000.

Banton, Martin E.: *See*—
Lehmbeck, Donald R.; and Banton, Martin E., 4,610,530, Cl. 355-14.0TR.

Baran, Stanley J.: *See*—
Van Camp, John; and Baran, Stanley J., 4,610,849, Cl. 422-111.000.

Barati, Peter: *See*—
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Barch, Herbert W., to PPG Industries, Inc. Filtration cartridge and reactor. 4,610,789, Cl. 210-321.400.

Barker, Gary T.; and Miller, James A., to Deere & Company. Load control system. 4,610,193, Cl. 91-420.000.

Barker, Peter F. Rechargeable battery system. 4,611,161, Cl. 320-2.000.

Barnes, Christine B., to Babcock & Wilcox Company, The. Pneumatic servo assembly for an electro pneumatic converter. 4,610,263, Cl. 137-85.000.

Barnes, Derek, to MacMillan Bloedel Limited. Long wafer waferboard panels. 4,610,913, Cl. 428-215.000.

Barnett, Eugene R.: *See*—
Miller, Dennis R.; and Barnett, Eugene R., 4,610,310, Cl. 169-37.000.

Baron, Burwell E.; Kirsch, Gary E.; and Mott, Keith C., to Hydril Company. Apparatus and method for installing internal annular rings in tubular box members. 4,610,834, Cl. 264-249.000.

Barreto, Ramon R., to Serpentine Corporation. Duct forming machine strip material alignment compensating system. 4,610,749, Cl. 156-429.000.

Barrett, Charles A.; and Lowell, Carl E., to United States of America, National Aeronautics and Space Administration. Nickel base coating alloy. 4,610,736, Cl. 148-429.000.

Barrus, Donald M.: *See*—
Hatch, George L.; Brummond, William A.; and Barrus, Donald M., 4,611,147, Cl. 313-550.000.

Barta, Donald J.; and Sollner, George H., to Phelps Dodge Industries, Inc. Essentially linear polymer having a plurality of amide, imide and ester groups therein, and a method of making the same. 4,611,050, Cl. 528-289.000.

Bartholomew, Donald D., to Proprietary Technology. Automotive fuel filler system. 4,610,284, Cl. 141-302.000.

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Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,610,999, Cl. 514-401.000.
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Albrecht, Hans P.; and Kreiskott, Horst, 4,610,817, Cl. 514-2.000.
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Buethe, Ingolf; Marx, Matthias; and Schonleben, Willibald, 4,611,083, Cl. 560-351.000.
Merger, Franz; and Towae, Friedrich, 4,611,079, Cl. 560-25.000.
Oberlinner, Andreas, 4,611,070, Cl. 549-344.000.
Schefczik, Ernst, 4,611,064, Cl. 548-484.000.
Schwarz, Gerd-Ulrich; Theobald, Hans; and Adolphi, Heinrich, 4,611,010, Cl. 514-521.000.

Bass, James T.: *See*—
Miller, Timothy J. E.; and Bass, James T., 4,611,157, Cl. 318-696.000.

Bass, John C.: *See*—
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Bateman, Charles D.: *See*—
Butenko, R. Bruce; Sprague, Randall B.; and Bateman, Charles D., 4,611,304, Cl. 364-571.000.

Batt, James E. Light emitting diode intensity tester. 4,611,116, Cl. 250-239.000.

Battelle Memorial Institute: *See*—
Debsikdar, Jagadish C.; and Mutsuddy, Beebhas C., 4,610,866, Cl. 423-600.000.

Baudis, Ulrich; Biberbach, Peter; and Engelmann, Rainer, to Degussa Aktiengesellschaft. Crucible for holding salt baths for the boriding of steels. 4,610,437, Cl. 266-275.000.

Baudoin, Patrice: *See—*
Houley, Daniel; and Baudoin, Patrice, 4,610,181, Cl. 74-792.000.

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Bausano, Domenick: *See—*
Lipscomb, Robert L.; Cargle, Virgil H.; and Bausano, Domenick, 4,610,897, Cl. 427-212.000.

Baxter Travenol Laboratories, Inc.: *See—*
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Haberkorn, Axel; Kolling, Heinrich; Kume, Toyohiko; and Kuyama, Shinpei, 4,611,060, Cl. 548-171.000.
Koebernick, Wolfgang, 4,611,058, Cl. 546-242.000.
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Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, 4,611,034, Cl. 525-420.000.
Musch, Rudiger; Nuyken, Oskar; Pask, Stephen D.; Vischer, Axel; and Walter, Michael, 4,611,037, Cl. 526-135.000.

Bayer, Karl: *See—*
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Bazell, Seymour: *See—*
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Beakley, Billy, to Directional Enterprises, Inc. Stabilizer blade. 4,610,320, Cl. 175-409.000.

Beard, Charles D.; Doddi, Namassivaya; and Yamada, Akira, to Iolab Corporation. 2'-hydroxy-5'-(hydroxyalkyl)phenyl-2H-benzotriazoles. 4,611,061, Cl. 548-260.000.

Beaver, Richard N.; Dang, Hiep D.; and Newton, H. Gene, to Dow Chemical Company, The. Seal means for electrolytic cells. 4,610,765, Cl. 204-128.000.

Bechgaard, Carl C. Protective composition with penetrating carrier. 4,610,881, Cl. 424-148.000.

Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, to Hoechst Aktiengesellschaft. 4-substituted Δ2-imidazolinyl-thioethers with prostaglandin-like activity. 4,610,999, Cl. 514-401.000.

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Beck, Niels J.; Gilbert, Edward T.; Weseloh, William E.; and Rudolph, Kenneth, to Orshansky Transmission Corporation. Fast response solenoid valve. 4,610,267, Cl. 137-329.300.

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Becker, Johann A.; Wirth, Helmut; and Zell, Werner, to U.S. Philips Corporation. Sheath for light waveguides. 4,610,505, Cl. 350-96.230.

Beckett, Christine A.: *See—*
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Beckett, Donald E. Demetallizing method. 4,610,755, Cl. 156-634.000.

Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, to Imperial Chemical Industries PLC. Process for resolving certain spiro compounds. 4,611,062, Cl. 548-309.000.

Bednar, Gregory M.; Fryer, George B.; and Narasimha, Manthri S., to International Business Machines Corporation. Method and apparatus for character recognition accommodating diacritical marks. 4,611,346, Cl. 382-9.000.

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Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,610,992, Cl. 514-320.000.

Beecher, William H. Valve for relieving pressure or checking reverse flow. 4,610,275, Cl. 137-854.000.

Bell, Frederick K.; and Raleigh, Freddie L., to Warner & Swasey Company, The. Bridge type coordinate measuring machine. 4,610,089, Cl. 33-1.00M.

Belly, Robert T.: *See—*
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Bemis Company, Inc.: *See—*
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Bench, Leigh R., Sr. Laminated door to withstand vandalism and method of manufacture thereof. 4,610,119, Cl. 52-309.300.

Benjamin, Terrell A.: *See—*
Tubergen, Timothy S.; and Benjamin, Terrell A., 4,610,895, Cl. 427-98.000.

Benn, James A.: *See—*
Reti, Adrian R.; and Benn, James A., 4,610,790, Cl. 210-636.000.

Bennett, Adam J.; Capes, C. Edward; Thayer, William L.; and Toll, Floyd N., to Canadian Patents and Development Limited. Particulate material in a liquid. 4,610,547, Cl. 366-270.000.

Bennett, R. James, to United States of America, Air Force. Turnaround control for mechanically scanned radar antennas. 4,611,210, Cl. 343-359.000.

Bentley, James H., to United States of America, Army. Self-pumped spark gap. 4,611,142, Cl. 313-30.000.

Bentley, John C. Bullet for black powder rifles. 4,610,205, Cl. 102-529.000.

Benz, Wilheim: *See—*
Kotitschke, Gerhard; and Benz, Wilheim, 4,610,097, Cl. 34-117.000.

Berg, James G.: *See—*
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Berger, Eduard: *See—*
Fuchs, Ernst; Berger, Eduard; and Fitzi, Karl, 4,610,281, Cl. 140-140.000.

Berger, Hans S.: *See—*
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,610,640, Cl. 446-329.000.

Berger, Jean-Luc; Brissot, Louis; and Cazaux, Yvon, to Thomson-CSF. Analysis process of a line transfer photosensitive device and operating device of such a process. 4,611,234, Cl. 358-213.000.

Berger, Joel G., to Schering Corporation. Substituted dipeptides as inhibitors of enkephalinases. 4,610,816, Cl. 549-452.000.

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Bernady, Karel F.: *See—*
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Bernard Matthews plc: *See—*
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Bernasconi, Christian; Llinares, Michel; and Nouguier, Robert, to Elf France. Process for the formation of homogeneous fuel compositions containing a petroleum cut and at least one short chain aliphatic alcohol and compositions thereby obtained. 4,610,696, Cl. 44-56.000.

Bertetti, Paolo: *See—*
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Bertz, Hans-Ulrich; and Golder, Peter, to Hofler, Willy. Automatic gear testing apparatus. 4,610,091, Cl. 33-179.50R.

Besnard, Henri; and Fremau, Daniel, to Trouvay & Cauvin S.A.; and Morello, Aldo, a part interest. Self cleaning valve for powdery, granular and pasty products. 4,610,430, Cl. 251-327.000.

Besterci, Anthony P., Jr.: *See—*
Gasparro, Michael R.; and Besterci, Anthony P., Jr., 4,610,838, Cl. 376-248.000.

Betush, Frank A., to Progressive Machine Products, Inc. Dental instrument stand. 4,610,630, Cl. 433-79.000.

Bey, Roger. Attenuated rotating valve. 4,610,273, Cl. 137-625.320.

Beyer, E. H. Erwin: *See—*
Andrae, Wolfhart; Andrae, Hans P.; Beyer, E. H. Erwin; Bayer, Karl; and Lohmann, Manfred, 4,610,431, Cl. 254-93.0HP.

Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, to Degussa Aktiengesellschaft. Process for the production of fillings for teeth. 4,610,631, Cl. 433-228.100.

Beyerle, Rudi: *See—*
Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,610,984, Cl. 514-235.000.

Bhagat, Jayant K., to General Motors Corporation. Thyristor with turn-off FET. 4,611,235, Cl. 357-38.000.

BHS-Bayerische Berg-Hutten -und Salzwerk AG: *See—*
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Biberbach, Peter: *See—*
Baudis, Ulrich; Biberbach, Peter; and Engelmann, Rainer, 4,610,437, Cl. 266-275.000.

Biearman, Lorraine. Medical protective sleeve. 4,610,245, Cl. 128-82.000.

Big Jon, Inc.: *See—*
Emory, John E., Jr., 4,610,409, Cl. 242-106.000.

Billingsley, Michael J., to Rolscreen Company. Lock for casement windows. 4,610,472, Cl. 292-54.000.

Bilotti, Federico: *See—*
Rothfuss, Robert G.; Bilotti, Federico; Chow, Hector; Hueil, J. Charles; and Sambi, Narinderjit S., 4,610,383, Cl. 227-19.000.

Bilstad, Arnold C.; and Kruger, Robert J., to Baxter Travenol Laboratories, Inc. Fluid processing system with flow control manifold. 4,610,781, Cl. 210-85.000.

Binney & Smith, Inc.: *See—*
Sahler, John T.; and Laubach, Marianne G., 4,610,096, Cl. 33-565.000.

Birdwell, Jeffrey D., to Dow Chemical Company, The. Method for forming polymer films having bubble release surfaces. 4,610,762, Cl. 204-1.00R.

Bivona Surgical Instruments, Inc.: *See—*
Depel, William A.; Weinberg, Bernd; and Moon, Jerald B., 4,610,691, Cl. 623-9.000.

Black & Decker Inc.: *See—*
Cox, Alan W., 4,610,111, Cl. 51-170.0MT.

Blackburn, William P.: *See*—
Olson, Kurt G.; Blackburn, William P.; and Endlish, Mark E., 4,611,040, Cl. 526-279.000.
Blain, Edward S., to Sundstrand Corporation. Unloading of scroll compressors. 4,610,610, Cl. 418-14.000.
Blain, Edward S., to Sundstrand Corporation. Scroll type positive displacement apparatus with tension rods secured between scrolls. 4,610,611, Cl. 418-55.000.
Blaschke, Marilyn W.: *See*—
Miller, Richard F.; and Blaschke, Marilyn W., 4,611,073, Cl. 556-442.000.
Blass, Harold, executor: *See*—
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Bleier, Frank P., to Industrial Air, Inc. Adjustable-pitch axial fan wheel. 4,610,600, Cl. 416-207.000.
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Board of Trustees Operating Michigan State University: *See*—
Fogwell, Ralph L., 4,610,687, Cl. 604-891.000.
Boaz, James, to LOR, Inc. Free flow stabilizer. 4,610,316, Cl. 175-323.000.
Bobst SA: *See*—
Land, Pierre; and Meylan, Georges, 4,610,444, Cl. 271-12.000.
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Koppers, Manfred; Bohnes, Karlheinz; Guse, Kuno; and Amling, Friedel, 4,610,424, Cl. 251-121.000.
Bock, Immo E., to Johannesburg Construction Corporation (Proprietary Limited). Electrical sequential firing system. 4,610,203, Cl. 102-217.000.
Bockett-Pugh, Charles P., to Schlumberger Electronics (U.K.) Limited. Non-volatile data stores. 4,611,302, Cl. 365-229.000.
Bodmer, Jerome R.; and Miller, Robert E., to Appleton Papers Inc. Record member. 4,610,727, Cl. 106-21.000.
Boecker, Wolfgang D. G.; and Hailey, Laurence N., to Kennecott Corporation. Silicon carbide-to-metal joint and method of making same. 4,610,934, Cl. 428-627.000.
Boeing Company, The: *See*—
Amberg, Robert L.; and Rosenberg, Jerome C., 4,610,484, Cl. 303-100.000.
Corbett, Darrell H.; and Speelmon, C. Robert, 4,610,402, Cl. 242-7.220.
Frey, Luther R., 4,610,837, Cl. 264-339.000.
Bogden, Arthur E., to EG&G Mason Research Institute. Method for in vivo testing of biological response modifiers including monoclonal antibodies. 4,610,869, Cl. 424-9.000.
Bogner, Mary A.: *See*—
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Bohlen, Peter; Esch, Frederick S.; Ling, Nicholas C.; Brazeau, Paul E., Jr.; and Guillemin, Roger C. L., to Salk Institute for Biological Studies, The. Porcine GRF. 4,610,976, Cl. 514-12.000.
Bohnes, Karlheinz: *See*—
Koppers, Manfred; Bohnes, Karlheinz; Guse, Kuno; and Amling, Friedel, 4,610,424, Cl. 251-121.000.
Bolger, Robert M.; and Marko, Neil L., to Universal Industrial Products Co., a Div. of Core Industries, Inc. Lawn mower blade with variable depth thatching device. 4,610,129, Cl. 56-17.500.
Boltze, Carsten: *See*—
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Bond, William B., to Du Pont de Nemours, E. I., and Company. Antistatic hairbrush filament. 4,610,925, Cl. 428-368.000.
Bongers, Jozef J. M.: *See*—
Vrinssen, Cornelis H.; van Gennen, Albert A.; and Bongers, Jozef J. M., 4,611,052, Cl. 528-312.000.
Boop, Donald C.; and Bernady, Karel F., to American Cyanamid Company. Process for preparing 6-[D(-)-α-(4-$C_1$-$C_4$)-alkyl-2,3-dioxo-1-piperazinocarbonylamino)phenylacetamido]penicillanic acids. 4,610,822, Cl. 540-316.000.
Boothroyd, Donald C.; Wilhite, John E.; and Norman, Robert W., Jr., to Honeywell Information Systems Inc. Wraparound buffer for repetitive decimal numeric operations. 4,611,278, Cl. 364-200.000.
Borg-Warner Automotive, Inc.: *See*—
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Bornstein, Leopold F., deceased (by Bornstein, Marcia G., executrix); and Fillingame, Gary P., to Georgia-Pacific Resins, Inc. Melamine-modified phenolic type resin for continuous lamination. 4,611,020, Cl. 524-233.000.
Bornstein, Marcia G., executrix: *See*—
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Borst, Ronald W., to Clay and Bailey Manufacturing Co., Inc. Drive-in manhole step construction. 4,610,330, Cl. 182-90.000.
Bosso, Joseph F.; and Geiger, William J., to PPG Industries, Inc. Method of electrodeposition employing low temperature aminoplast curable cationic electrodepositable coating compositions. 4,610,769, Cl. 204-181.700.
Boudry, Daniel: *See*—
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Bouldin, Floyd E.; Bouldin, E. Lloyd; Cantrell, Thomas E.; and Pearsall, Floyd A., 4,610,596, Cl. 414-412.000.
Bouldin, Floyd E.; Bouldin, E. Lloyd; Cantrell, Thomas E.; and Pearsall, Floyd A., to Bouldin & Lawson, Inc. Apparatus for removing cover from baled material. 4,610,596, Cl. 414-412.000.
Bouldin & Lawson, Inc.: *See*—
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Bousquet, Jean: *See*—
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Box, William A.; and Rogers, John W., to Coiled Investments, Inc. Strip feed mechanism. 4,610,408, Cl. 242-78.600.
Boyadjieff, George I., to Varco International, Inc. Structure and use of remotely releasable pile connectors. 4,610,465, Cl. 285-3.000.
Boyd, Mary G.: *See*—
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Bradfield, James E.: *See*—
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Bradley, Morgan B. Combination switch light and rechargeable flashlight. 4,611,264, Cl. 362-95.000.
Brady, Thomas. Measuring instrument. 4,610,090, Cl. 33-148.00R.
Braman, Dow and Company: *See*—
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Brandenstein, Manfred: *See*—
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Brandes, Wilhelm: *See*—
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Brandman, Yigal: *See*—
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Brandner, Burkhard, to Atlas Fahrzeugtechnik GmbH. Piezoceramic valve plate for a low-pressure injection valve and process for the production thereof. 4,610,426, Cl. 251-129.060.
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Bravenec, Frank R.; Hall, Hugh E., Jr.; Merchant, Gulamabbas A.; and Thadani, Suresh G., to Halliburton Company. Induction logging system featuring variable frequency corrections for propagated geometrical factors. 4,611,173, Cl. 324-339.000.
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Bredal, Torben, to Tri-Bolt Fasteners ApS. Screw anchoring bushing for use in semihard materials. 4,610,589, Cl. 411-180.000.
Bregenzer, Rene , to Swiss Aluminium Ltd. Process for stepwise heating up metallic strips or foils. 4,610,747, Cl. 156-322.000.
Bridgestone Corporation: *See*—
Morimura, Shinji, 4,610,219, Cl. 119-3.000.
Brig Research Ltd.: *See*—
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Brinkwerth, Wolfgang; and Eckstein, Udo, to Bayer Aktiengesellschaft. Distyryl compounds. 4,610,807, Cl. 252-301.210.
Brissot, Louis: *See*—
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British Petroleum Company p.l.c., The: *See*—
Kitson, Melanie, 4,611,085, Cl. 568-885.000.
Brittain, David R.: *See*—
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,611,062, Cl. 548-309.000.
Broan Manufacturing Co. Inc.: *See*—
Sarnosky, Joseph R.; and Wolbrink, David W., 4,610,705, Cl. 55-316.000.
Brockhurst, David M.; Vivian, Roy H.; Dyer, Martyn R.; and Day, Stephen, to Independent Broadcasting Authority. Decoder for digital information T.V. signal. 4,611,227, Cl. 358-147.000.
Brockmeyer, Jerry W., to Swiss Aluminium Ltd. Process for preparing a ceramic foam. 4,610,832, Cl. 264-44.000.
Brockway, Brian R., to Vickers Public Limited Company. Marine anchors. 4,610,570, Cl. 405-224.000.
Brody, William R., to Leland Stanford Junior University, The Board of Trustees of the. Multiple-energy x-ray substraction imaging system. 4,611,341, Cl. 378-99.000.
Broer, Dirk J.; and Finck, Johan C. J., to U.S. Philips Corporation. Method of optically connecting a light conductor to an electro-optical device. 4,610,746, Cl. 156-275.500.
Bronner, James A.; Moore, John D.; and Dale, Paul R., to Sanitek Products, Inc. Method for reducing the aerial drift of aqueous preparations. 4,610,311, Cl. 169-45.000.
Brooks Electrofoil Seaming Systems Pty. Ltd.: *See*—
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Brooks, Graham L.; Pateman, Antony F.; Thomson, Michael A.; and Scott, John, to Sodastream Limited. Liquid carbonating apparatus. 4,610,282, Cl. 141-46.000.

Brooks, Roger I.: *See—*
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Brooks, Ronald H., to Brooks Electrofoil Seaming Systems Pty. Ltd. Carpet seaming tapes with two metal foil layers. 4,610,906, Cl. 428-102.000.

Brother Kogyo Kabushiki Kaisha: *See—*
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Brown, Dennis N., to Northwest Podiatric Laboratories, Inc. Orthotic insert. 4,610,101, Cl. 36-44.000.

Brown, Richard A.: *See—*
Norris, Robert D.; Brown, Richard A.; and Brubaker, Gaylen R., 4,610,795, Cl. 252-8.551.

Brown-Wensley, Katherine A.; and Sinclair, Robert A., to Minnesota Mining and Manufacturing Company. Polyhydridosilanes and their conversion to pyropolymers. 4,611,035, Cl. 525-474.000.

Broyer, Julien; and de Marancour, Bernard M., to S.R.P.M.:Societe de Realisation de Productions Metalliques. System for the power-assisted opening of parasols and the like. 4,610,262, Cl. 135-23.000.

Brubaker, Gaylen R.: *See—*
Norris, Robert D.; Brown, Richard A.; and Brubaker, Gaylen R., 4,610,795, Cl. 252-8.551.

Bruckert, Eugene J.: *See—*
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Bruggemann, Ulrich, to VDO Adolf Schindling AG. Electric display device of a vehicle. 4,611,193, Cl. 340-52.00F.

Bruhn, Hans-Peter. Hand-operated gas lighter. 4,610,624, Cl. 431-255.000.

Brummond, William A.: *See—*
Hatch, George L.; Brummond, William A.; and Barrus, Donald M., 4,611,147, Cl. 313-550.000.

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Bruson, Virginia H.: *See—*
Bruson, Herman A.; and Frisch, Kurt C., 4,611,043, Cl. 528-49.000.

Bryson, John D., to Vaportek, Inc. Molded dispensing container. 4,610,394, Cl. 239-57.000.

Buchel, Karl H.: *See—*
Kraatz, Udo; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Hanssler, Gerd, 4,610,996, Cl. 514-383.000.

Buchwald, Henry; Guzman, Eugenio; and Wigness, Bruce D. Automated peritoneovenous shunt. 4,610,658, Cl. 604-9.000.

Buckingham, Robin E.: *See—*
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,610,992, Cl. 514-320.000.

Budzich, Tadeusz, to Caterpillar Inc. Load sensing circuit of load responsive direction control valve. 4,610,194, Cl. 91-446.000.

Buehler, John D., to Dougherty Brothers Company. Apparatus for mixing flowable materials in sealed containers. 4,610,374, Cl. 222-83.000.

Buethe, Ingolf; Marx, Matthias; and Schonleben, Willibald, to BASF Aktiengesellschaft. Liquid, urea group-containing polyisocyanate mixtures. 4,611,083, Cl. 560-351.000.

Buhse, Ulf H.; and Kuhn, Hans-Jurgen, to U.S. Philips Corporation. Television receiver incorporating a processing section for processing stereo/multichannel-sound signals. 4,611,226, Cl. 358-144.000.

Buisson, Didier: *See—*
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Buller-Colthurst, Guy E., to Knud Simonsen Industries Limited. Multi-conveyor processing system. 4,610,886, Cl. 426-233.000.

Bunn, Richard L. Burner. 4,610,625, Cl. 431-284.000.

Burch, John D. Solar lighter. 4,610,240, Cl. 126-440.000.

Burghardt, Stanley M. Service saddle U-bolt installation holder. 4,610,439, Cl. 269-3.000.

Burkus, Michael. Method and composition of matter for conditioning and passivating certain metals. 4,610,798, Cl. 252-79.200.

Burmaster, Neal C.: *See—*
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Burr-Brown Corporation: *See—*
Naylor, Jimmy R.; and Mietus, David F., 4,611,178, Cl. 330-272.000.

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Lewis, Terrence E.; Smiley, Stephen A.; Rice, Rex; Lipkes, Zeev; and Nelson, John A., 4,611,238, Cl. 357-81.000.

Busch, Dieter; and Sannig, Ulrich, to W. Schlafhorst & Co. Thread draw-off nozzle for an open-end rotor spinning machine. 4,610,134, Cl. 57-417.000.

Buschur, Jeffrey J.; Franklin, Ernest G.; and Shufflebarger, William S., to General Motors Corporation. Variable throw crank arm assembly for windshield wiper drive. 4,610,046, Cl. 15-250.160.

Butenko, R. Bruce; Sprague, Randall B.; and Bateman, Charles D., to Sundstrand Data Control, Inc. Transducer memory circuit. 4,611,304, Cl. 364-571.000.

Byrd, Betty L. Jogger's rod. 4,610,447, Cl. 272-70.000.

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Schwartz, Frederic W., 4,611,266, Cl. 362-226.000.

Calculagraph Company: *See—*
Fryer, Warren R., 4,611,336, Cl. 375-111.000.

Caldicott, Jack R.: *See—*
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California Institute of Technology: *See—*
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Cameron, Ewen R.: *See—*
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Camosso, Domenico; Ragazzoni, Silvio; and Colanzi, Franco, to RIV-SKF Officine di Villar Perosa, SpA. Hydraulic tappet for controlling an internal combustion engine valve. 4,610,225, Cl. 123-90.550.

Campbell, Donn V.; Dubowicz, Palemon W.; and Schwering, Felix, to United States of America, Army. Tactical high frequency array antennas. 4,611,214, Cl. 343-790.000.

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Campisi, Carl; Kilinskis, David C.; Skerlos, Peter C.; and Sorlie, Egil, to Zenith Electronics Corporation. Method and apparatus for electronic component matching. 4,610,083, Cl. 29-832.000.

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Canavesi, Pietro L.; and Zwicky, Peter, to Gunimperm S.A. Seal against penetration of water into masonry. 4,610,120, Cl. 52-511.000.

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Canon Kabushiki Kaisha: *See—*
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,610,202, Cl. 101-364.000.
Hayashi, Nobuhiro; Nakahata, Kimio; Tajima, Hatsuo; and Nakamura, Shunji, 4,610,531, Cl. 355-14.00D.
Kamata, Shigeru, 4,610,512, Cl. 350-429.000.
Matsumoto, Toru; Yamazaki, Masuo; and Wakamiya, Katsutoshi, 4,610,944, Cl. 430-135.000.
Nakano, Shigeki; and Totsuka, Masao, 4,611,122, Cl. 250-548.000.
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Suwa, Kaname, 4,611,261, Cl. 361-399.000.
Takahata, Naomi, 4,610,533, Cl. 355-14.0SH.
Takiguchi, Takao; Miyazaki, Hajime; Matsumoto, Masakazu; and Ishikawa, Shozo, 4,610,943, Cl. 430-76.000.
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Yoshida, Masaaki; and Kataoka, Hiroyuki, 4,610,525, Cl. 354-415.000.

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Capes, C. Edward: *See—*
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Carbonell Serra, Enrique; and Boudry, Daniel. Process for the treatment of municipal refuse and plant for its execution. 4,610,396, Cl. 241-24.000.

Carduck, Franz-Josef: *See—*
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Carene, Nicholas J., Jr., to Ex-Cell-O Corporation. Tooth forming tool with toothless clamping section for splining tubular elements. 4,610,154, Cl. 72-88.000.

Cargle, Virgil H.: *See—*
Lipscomb, Robert L.; Cargle, Virgil H.; and Bausano, Domenick, 4,610,897, Cl. 427-212.000.

Caries Research Group of Rochester, Inc.: *See—*
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Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See—*
Erhardt, Manfred, 4,610,576, Cl. 407-21.000.
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Carolinch Company, The: *See*—
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Carroll, Frank E. Insulating shutter panels for building openings. 4,610,291, Cl. 160-117.000.
Carsac, Claude: *See*—
Larue, Jean-Pierre; Duboz, Georges; Carsac, Claude; and Marhic, Gerard, 4,611,109, Cl. 219-121.0PY.
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Cassella Aktiengesellschaft: *See*—
Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,610,984, Cl. 514-235.000.
Casset, Dominique, to Mors. Self-contained workpiece-holding device, preferably equipped with an operating system, and also advantageously provided with individual power-cylinder operating means for operating it at an independent pressure. 4,610,440, Cl. 269-20.000.
Castello, Jose M.: *See*—
Foguet, Rafael; Forne, Ernesto; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,610,998, Cl. 514-399.000.
Catalano, J. Denis. Dual muscle clamp. 4,610,252, Cl. 128-346.000.
Catella, Gary C.; Cull, Ronald C.; Dilts, David A.; Koch, Paul E.; and Hartman, Robert A., to Standard Oil Company. Semirigid photovoltaic module assembly and structural support therefor. 4,611,090, Cl. 136-251.000.
Caterpillar Inc.: *See*—
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Berger, Jean-Luc; Brissot, Louis; and Cazaux, Yvon, 4,611,234, Cl. 358-213.000.
Cecchellero, Sergio; and Salvatore, Daniele, to Italtel Tecnomeccanica S.p.A. Sectional structure for carpentry, particularly to realize cubicles. 4,610,561, Cl. 403-171.000.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Dubost, Bruno, 4,610,735, Cl. 148-128.000.
Central Glass Company, Limited: *See*—
Kuramoto, Tohru; Miki, Toshiharu; Nishino, Kozo; and Ono, Hiroshi, 4,610,864, Cl. 423-344.000.
Chan, Albert S. C.; and Morris, Donald E., to Monsanto Company. Production of hex-3-enedioate esters from 1,4 dialkoxy butenes. 4,611,082, Cl. 560-204.000.
Chandler, Richard G. Rodent trap. 4,610,105, Cl. 43-69.000.
Channel-KOR Systems Inc.: *See*—
Miller, Melvin M., 4,610,560, Cl. 403-119.000.
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Lambropoulos, George P.; Charboneau, Benjamin J.; and Eilola, David H., 4,611,154, Cl. 318-490.000.
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Chattha, Mohinder S., to Ford Motor Company. Dicarboxylic acid azomethines and high glass transition temperature polyester products produced therefrom. 4,611,047, Cl. 528-114.000.
Chatzitheodorou, Georg: *See*—
Kossmehl, Gerhard; and Hocker, Jurgen, 4,611,032, Cl. 525-360.000.
Chauvin, Jacques; and Canzian, Patrice, to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E. Method and device for controlling the heating of a thermostatically controlled enclosure for an oscillator. 4,611,182, Cl. 331-69.000.
Chauvin, William J.: *See*—
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Chemical Fabrics Corporation: *See*—
Effenberger, John A.; Ribbans, Robert C., III; and Keese, Frank M., 4,610,918, Cl. 428-245.000.
Chen, Janglin; Kelly, James E.; and Plakunov, James, to Eastman Kodak Company. Antistatic compositions comprising polymerized oxyalkylene monomers and an inorganic tetrafluoroborate, perfluoroalkyl carboxylate, hexafluorophosphate or perfluoroalkylsulfonate salt. 4,610,955, Cl. 430-527.000.
Chen, Richard J.: *See*—
Smyth, William K.; Chen, Richard J.; and Plummer, William T., 4,610,536, Cl. 355-38.000.
Chen, Ying C.: *See*—
Liu, Jia-Ming; and Chen, Ying C., 4,611,328, Cl. 372-45.000.
Chenard, Bertrand L., to Du Pont de Nemours, E. I., and Company. Antimycotic pyrazolotetrathiepins. 4,611,001, Cl. 514-407.000.
Chenoweth, David A.; and Davis, Thornton R., Jr., to Paxall Group, Inc., The. Combination weighing system. 4,610,323, Cl. 177-25.000.
Cherbuy, Bernard; and Magnenet, Jean, to Cii Honeywell Bull (Societe Anonyme). Apparatus for developing latent magnetic images. 4,610,527, Cl. 355-3.0DD.
Chern, Mao-Jin; and Smith, Ronald T., to United States of America, Air Force. Diffraction diffusion screen with holographically suppressed zero-order beam. 4,610,499, Cl. 350-3.700.
Cheux, Auguste: *See*—
Brun, Claude; Cheux, Auguste; and Pelletier, Robert, 4,611,038, Cl. 526-169.200.
Chevallier, Jacques P.; Dautremont-Smith, William C.; and Tu, Charles W., to AT&T Bell Laboratories. Shallow impurity neutralization. 4,610,731, Cl. 148-1.500.
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Hughes, Thomas R., 4,610,972, Cl. 502-52.000.
Ikeda, Keiichiro, 4,611,312, Cl. 367-38.000.
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Chicago Metallic Corporation: *See*—
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Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.
Chirash, William; and Wixon, Harold E., to Colgate-Palmolive Co., The. Fabric softener composition containing molecular sieve zeolite. 4,610,796, Cl. 252-8.750.
Chisholm, Melvin D.: *See*—
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Kajitani, Taizo; Fujii, Shigeo; Sato, Tadao; Yonehara, Ikuo; Fukumura, Chikashi; and Harita, Kenji, 4,610,862, Cl. 423-310.000.
Chiu, Ran F.: *See*—
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Chiyoda, Tsuneyuki: *See*—
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Choi, Dai S. Book holder. 4,610,416, Cl. 248-459.000.
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., to Atlantic Richfield Company. $CuInSe_2$ thin film solar cell with thin CdS and transparent window layer. 4,611,091, Cl. 136-260.000.
Chow, Hector: *See*—
Rothfuss, Robert G.; Bilotti, Federico; Chow, Hector; Hueil, J. Charles; and Sambi, Narinderjit S., 4,610,383, Cl. 227-19.000.
Christ, Alfred; and Lehmann, Rolf, to Sulzer-Escher Wyss AG. Heat insulating protective shields for two-roll calender with heated rolls. 4,610,617, Cl. 425-143.000.
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. Process for the preparation of thienamycin and intermediates. 4,610,820, Cl. 540-200.000.
Christiansen, Richard L., to Marathon Oil Company. Method of determining the minimum level of enrichment for a miscible gas flood. 4,610,160, Cl. 73-151.000.
Chuang, Patrick T.; Maltiel, Ron; and Yau, Robert L., to Advanced Micro Devices, Inc. Non-volatile dynamic RAM cell. 4,611,309, Cl. 365-185.000.
Ciba-Geigy Corporation: *See*—
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Hinsken, Hans; Mayerhoefer, Horst; Mueller, Wolfgang; and Schneider, Hermann, 4,611,016, Cl. 529-99.000.
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,610,980, Cl. 514-94.000.
Muller, Horst, 4,611,012, Cl. 521-89.000.
Nachbur, Hermann; and Tempel, Christel, 4,611,072, Cl. 556-135.000.
Spivak, John D.; and Pastor, Stephen D., 4,611,023, Cl. 524-326.000.
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,611,041, Cl. 526-298.000.
Cii Honeywell Bull (Societe Anonyme): *See*—
Cherbuy, Bernard; and Magnenet, Jean, 4,610,527, Cl. 355-3.0DD.
Ciolli, Donald A., to American Assembly Tools, Inc. Adjustable torque limiting assembly. 4,610,339, Cl. 192-48.920.
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Strobel, Jean-Paul, 4,610,756, Cl. 156-645.000.
Citizen Watch Co., Ltd.: *See*—
Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00F.
Yasunaga, Makoto; and Ikehata, Tsutomu, 4,610,553, Cl. 400-124.000.
Clarion Co., Ltd.: *See*—
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Clark, David J.; and Fahlen, Theodore S., to Amoco Corporation. Gas transport laser system. 4,611,327, Cl. 372-58.000.
Clark, J. Bennett, to Phillips Petroleum Company. Oil recovery processes. 4,610,302, Cl. 166-246.000.
Clark, Neville J.: *See*—
Baker, Bruce G.; Clark, Neville J.; McArthur, Hamish; and Summerville, Edward, 4,610,975, Cl. 502-302.000.
Claussen, Uwe, to Bayer Aktiengesellschaft. Azo dyestuffs and liquid-crystal material containing azo dyestuffs. 4,610,803, Cl. 252-299.100.
Clavell, Cesar, Jr., to United States of America, Navy. Variable temperature trap. 4,610,169, Cl. 73-863.120.
Clay and Bailey Manufacturing Co., Inc.: *See*—
Borst, Ronald W., 4,610,330, Cl. 182-90.000.
Clegg, John E. Involute beam concentrator. 4,610,518, Cl. 350-630.000.
Clegg, Wallace H. Settle blow head and baffle arm attachment for glassware molding machine. 4,610,713, Cl. 65-300.000.
Clik-Cut, Inc.: *See*—
Stubbmann, Albert, 4,610,407, Cl. 242-55.200.
Cline, William F., to Elliott Turbomachinery Co., Inc. Apparatus for mounting and removing a hub from a shaft. 4,610,066, Cl. 29-252.000.

CNS, Inc.: *See—*
Cohen, Daniel E.; and Strobl, Frederick T., 4,610,259, Cl. 128-731.000.
Cochran, Bruce A.: *See—*
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Codex Corporation: *See—*
Peterson, Benjamin C.; Linde, Yoseph L.; and Brandman, Yigal, 4,611,133, Cl. 307-465.000.
Codman & Shurtleff, Inc.: *See—*
Santangelo, John A.; and DiGiantommaso, Michael, 4,610,242, Cl. 128-4.000.
Cohen, Daniel E.; and Strobl, Frederick T., to CNS, Inc. EEG signal analysis system. 4,610,259, Cl. 128-731.000.
Coiled Investments, Inc.: *See—*
Box, William A.; and Rogers, John W., 4,610,408, Cl. 242-78.600.
Coker, Geoffrey G.; and Findlay, John W. A. Certain 1,1-diaryl-propenyl-3-(1-pyrrolidino-2-carboxylic acids, derivatives thereof and their anti-histaminic properties. 4,610,995, Cl. 514-343.000.
Colanzi, Franco: *See—*
Camosso, Domenico; Ragazzoni, Silvio; and Colanzi, Franco, 4,610,225, Cl. 123-90.550.
Coleco Industries, Inc.: *See—*
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,610,640, Cl. 446-329.000.
Piazza, Pietro, 4,610,639, Cl. 446-327.000.
Coles, Robert E.; and Newman, Alec T., to General Foods Ltd. Insulated drinking cups. 4,610,351, Cl. 206-217.000.
Colgate-Palmolive Co., The: *See—*
Chirash, William; and Wixon, Harold E., 4,610,796, Cl. 252-8.750.
Collier, John D., to Tamco Limited. Wire form support system for fuel tanks. 4,610,453, Cl. 280-5.00A.
Colsher, James G., to General Electric Company. Method for calculating blood flow using freely diffusible inert gases and CT. 4,610,258, Cl. 128-691.000.
Colt Industries Operating Corp: *See—*
Farmer, Donald J.; and Powell, Joseph F., III, 4,611,093, Cl. 174-152.00R.
Colvert, James H.; and Lionetti, Thomas A. Air distributor for FCCU catalyst regenerator. 4,610,851, Cl. 422-310.000.
Combustion Engineering, Inc.: *See—*
Darling, Scott L.; Tanca, Michael C.; and Thibeault, Paul R., 4,610,697, Cl. 48-77.000.
Maliszewski, Theodore V., 4,610,073, Cl. 29-527.600.
Maliszewski, Theodore V., 4,610,401, Cl. 241-294.000.
Comet Research, Inc.: *See—*
Perovich, Paul C., 4,610,389, Cl. 228-176.000.
Compagnie d'Electronique et de Piezo-Electricite C.E.P.E.: *See—*
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Compagnie Deutsch: *See—*
Vantouroux, Patrick, 4,610,564, Cl. 403-316.000.
Compagnie Francaise de Raffinage: *See—*
Crespin, Pierre; Guay, Francois; Galvin, Paul H.; and Gouzard, Jean-Paul, 4,610,695, Cl. 44-51.000.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See—*
Vinot, Daniel R., 4,611,276, Cl. 364-200.000.
Concato, Antonio, to Sander S.R.L. Automatic feet washing and massaging machine. 4,610,040, Cl. 4-622.000.
Conoco Inc.: *See—*
Ghassemi, Farhad; and Alexander, John D., 4,610,301, Cl. 166-245.000.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Eberhard, Gunter; and Heitzig, Jurgen, 4,610,438, Cl. 267-8.00R.
Huinink, Heinrich; Seitz, Hans; Rach, Heinz-Dieter; and Frerichs, Udo, 4,610,288, Cl. 157-1.220.
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Continental White Cap, Inc.: *See—*
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Control Concepts Corporation: *See—*
Montague, Herbert R., 4,611,190, Cl. 336-10.000.
Cook, Richard A.: *See—*
Weis, Philip J.; and Cook, Richard A., 4,610,175, Cl. 74-15.860.
Coppola, Anthony F. Computer power management system. 4,611,289, Cl. 364-492.000.
Corbett, Darrell H.; and Speelmon, C. Robert, to Boeing Company, The. Filament winding feed system. 4,610,402, Cl. 242-7.220.
Corby, Nelson R., Jr.: *See—*
Baheti, Radhakisan S.; and Corby, Nelson R., Jr., 4,611,111, Cl. 219-124.340.
Corley, Edward G.: *See—*
Volante, Ralph P.; Verhoeven, Thomas R.; Sletzinger, Meyer; McNamara, James M.; Liu, Thomas M. H.; and Corley, Edward G., 4,611,067, Cl. 549-292.000.
Corning Glass Works: *See—*
Palmquist, Ronald W.; and Thomas, Robert R., 4,611,331, Cl. 373-30.000.
Sarhangi, Ahmad; and Scherer, George W., 4,610,708, Cl. 65-3.120.
Corraz, Alfred J.: *See—*
Baruth, Herman W., Jr.; Berger, Leo; Corraz, Alfred J.; and Sepinwall, Jerry, 4,610,989, Cl. 514-282.000.
Corrigan, Owen I.: *See—*
Panoz, Donald E.; and Corrigan, Owen I., 4,610,875, Cl. 424-80.000.
Coupling Systems, Inc.: *See—*
Halen, Richard M.; and Walsh, Robert B., 4,610,471, Cl. 285-337.000.
Cox, Alan W., to Black & Decker Inc. Eccentrically adjustable attachments for power tools. 4,610,111, Cl. 51-170.0MT.
Craig, Daniel E.; Walker, Clarence E., Jr.; and Wilbur, Leonard P., Jr., to RCA Corporation. Frame centering apparatus. 4,610,636, Cl. 445-68.000.
CRC Pipeline International, Inc.: *See—*
Goekler, Robert G.; and King, Gary N., 4,610,403, Cl. 242-7.230.
Crehan, Donald T.; and Lovell, Charles J., to International Business Machines Corp. Display menu/chart key. 4,611,306, Cl. 364-900.000.
Crenshaw, Susan L. H.; Schlintz, Neal L.; and Moore, Danny R., to Procter & Gamble Company, The. Two-ply nonwoven fabric laminate. 4,610,915, Cl. 428-219.000.
Crespin, Pierre; Guay, Francois; Galvin, Paul H.; and Gouzard, Jean-Paul, to Compagnie Francaise de Raffinage. Fluid fuel mixture based on a pulverized solid fuel, petroleum residues and water, process for its preparation, and the use in boilers and industrial furnaces. 4,610,695, Cl. 44-51.000.
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., to International Business Machines Corporation. Video mode plasma display. 4,611,203, Cl. 340-773.000.
Crivello, James V., to General Electric Company. Photoresist compositions and method. 4,610,952, Cl. 430-325.000.
Crown International, Inc.: *See—*
Stanley, Gerald R., 4,611,180, Cl. 330-298.000.
CSELT—Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See—*
Gabrielli, Luciano; Lotito, Nicola; and Sposini, Maurizio, 4,611,321, Cl. 370-60.000.
Cucchi, Giovanni; and Cucchi, Pietro, to F.lli Cucchi S.r.l. Metal bar feed control device for the feeding of an automatic multiple-spindle lathe. 4,610,591, Cl. 414-14.000.
Cucchi, Pietro: *See—*
Cucchi, Giovanni; and Cucchi, Pietro, 4,610,591, Cl. 414-14.000.
Cull, Ronald C.: *See—*
Catella, Gary C.; Cull, Ronald C.; Dilts, David A.; Koch, Paul E.; and Hartman, Robert A., 4,611,090, Cl. 136-251.000.
Cunningham, Sinclair; and Wusthof, Peter, to Mannesmann Rexroth GmbH. Piston for a hydraulic piston machine of the multiple displacement type. 4,610,195, Cl. 91-488.000.
Cyr, Jesselyn T., to Tamrac, Inc. Camera bag with compensation for variable camera-support distance below lens, and with improved access. 4,610,286, Cl. 150-52.00J.
Czeiler, Andras; Keri, Miklos; Balogh, Bela; Fejes, Erno ; Kallai, Istvan; and Lukacs, Sandor, to Tungsram Reszvenytarsasag. Apparatus for electrostatic spraying of the insides of lamp envelopes. 4,610,217, Cl. 118-47.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Yamamoto, Toshiaki; and Kinami, Kenichi, 4,611,055, Cl. 536-119.000.
Daido Tokushuko Kaubshiki Kaisha: *See—*
Miyamura, Masao; Tsukakoshi, Osamu; Kamata, Yoshio; and Aiba, Shoji, 4,611,121, Cl. 250-423.00R.
Daidotokushuko Kabushikikaisha: *See—*
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, 4,610,296, Cl. 164-469.000.
Daiichi Seiyaku Co., Ltd.: *See—*
Ishikawa, Fumiyoshi, 4,610,987, Cl. 514-239.000.
Dailey, Gloria A. Case for displaying lipstick. 4,610,348, Cl. 206-45.190.
Dainippon Ink and Chemicals, Inc.: *See—*
Sekiguchi, Hisashi; Kobayashi, Norio; and Ohgishi, Hideo, 4,611,036, Cl. 525-481.000.
Dale, Paul R.: *See—*
Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,610,311, Cl. 169-45.000.
Daly, Christopher N.: *See—*
Ibrahim, Ibrahim H.; and Daly, Christopher N., 4,611,127, Cl. 307-116.000.
Daly, Jeffery E.; and Pastusek, Paul E., to Reed Tool Company. Drill bit having a failure indicator. 4,610,313, Cl. 175-40.000.
Damon, Billy L.; and Kliethermes, Andrew J., to Emerson Electric Co. Variable lead length assembly. 4,610,278, Cl. 140-92.100.
Damon, Robert E., II, to Sandoz Corp. Silicon-bearing amides. 4,611,063, Cl. 548-406.000.
Dana Corporation: *See—*
Weis, Philip J.; and Cook, Richard A., 4,610,175, Cl. 74-15.860.
Dang, Hiep D.: *See—*
Beaver, Richard N.; Dang, Hiep D.; and Newton, H. Gene, 4,610,765, Cl. 204-128.000.
D'Angelo, Jean; Revial, Gilbert; Azerad, Robert; and Buisson, Didier, to Roussel Uclaf. Tetra-alkyl-2,2,5,5-cyclohexanone-4-ol-1 and sulphonylated derivatives thereof. 4,610,826, Cl. 558-44.000.
Darbois, Claudine, to Electricite de France. Process for forming removable fluid tight sealing connections for high pressure ducts. 4,610,069, Cl. 29-421.00M.
Darda, Walter: *See—*
Henn, Manfred; and Darda, Walter, 4,610,652, Cl. 493-432.000.
Darling, Scott L.; Tanca, Michael C.; and Thibeault, Paul R., to Combustion Engineering, Inc. Coal gasification system with product gas recycle to pressure containment chamber. 4,610,697, Cl. 48-77.000.
DaRosa, Adelino B., to Ampad Corporation. Portfolio adapted for incorporation of a paper pad. 4,610,392, Cl. 229-1.50R.

Das, Jagabandhu, to E. R. Squibb & Sons, Inc. 5,6-epoxy-7-oxabicycloheptane substituted prostaglandin analogs useful in the treatment of thrombotic disease. 4,611,005, Cl. 514-468.000.

Das, Jagabandhu, to E. R. Squibb & Sons, Inc. 5,6-epoxy-7-oxabicycloheptane substituted ethers useful in the treatment of thrombotic disease. 4,611,006, Cl. 514-468.000.

Das, Jagabandhu, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane substituted prostaglandin analogs useful in the treatment of thrombotic disease. 4,611,007, Cl. 514-469.000.

Das, Suryya K.: *See—*
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,611,026, Cl. 524-548.000.

Dautel, David F.: *See—*
King, Dennis D.; and Dautel, David F., 4,610,549, Cl. 368-113.000.

Dautremont-Smith, William C.: *See—*
Chevallier, Jacques P.; Dautremont-Smith, William C.; and Tu, Charles W., 4,610,731, Cl. 148-1.500.

Davidson & Company Limited: *See—*
Gibson, Stanley; and Tindall, Colin, 4,610,297, Cl. 165-9.000.

Davidson, Jeffrey: *See—*
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,610,993, Cl. 514-335.000.

Davidson, Richard R.: *See—*
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,610,801, Cl. 252-181.000.

Davis, Charles L., to Abbott Laboratories. Apparatus and method for adjusting a curie effect temperature sensing system. 4,610,142, Cl. 62-3.000.

Davis, Dennis G. Lighted address display with emergency signal system. 4,611,265, Cl. 362-145.000.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-fluoro-1,2-benzisoxazol-3-yl)propyl]-4-(substituted)-piperazines useful for alleviating pain. 4,610,988, Cl. 514-253.000.

Davis, Thornton R., Jr.: *See—*
Chenoweth, David A.; and Davis, Thornton R., Jr., 4,610,323, Cl. 177-25.000.

Davy McKee (Sheffield) Limited: *See—*
Lawson, Kenneth T., 4,610,144, Cl. 62-63.000.

Day, Stephen: *See—*
Brockhurst, David M.; Vivian, Roy H.; Dyer, Martyn R.; and Day, Stephen, 4,611,227, Cl. 358-147.000.

Dayco Corporation: *See—*
Miranti, Joseph P., Jr., 4,610,648, Cl. 474-242.000.

Dean, William C., to FMC Corporation. Aircraft belt loader hinge assembly having a spring loaded shock absorbing hinge support. 4,610,049, Cl. 16-286.000.

DeBona, Bruce T.: *See—*
Akkapeddi, Murali K.; DeBona, Bruce T.; Li, Hsin L.; and Prevorsek, Dusan C., 4,611,025, Cl. 524-449.000.

Debsikdar, Jagadish C.; and Mutsuddy, Beebhas C., to Battelle Memorial Institute. Method for producing beta-aluminas. 4,610,866, Cl. 423-600.000.

DeCastro, William H., Jr.: *See—*
Arzberger, William A.; Riley, Michael J.; LaLumiere, Edward J.; and DeCastro, William H., Jr., 4,610,145, Cl. 62-127.000.

Decision Data Computer Corporation: *See—*
Miller, Robert J., 4,610,415, Cl. 248-455.000.

De Clercq, Marcel D. Concrete reinforcing rod holder. 4,610,122, Cl. 52-719.000.

Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, to Kiskunhalasi Allami Gazdasag. Process for the preparation of protein concentrates and nutriments by processing animal blood. 4,610,814, Cl. 530-380.000.

Dede nee Pal, Maria: *See—*
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Deere & Company: *See—*
Barker, Gary T.; and Miller, James A., 4,610,193, Cl. 91-420.000.
Zimmer, Myron P., 4,610,456, Cl. 280-165.000.

Degussa Aktiengesellschaft: *See—*
Baudis, Ulrich; Biberbach, Peter; and Engelmann, Rainer, 4,610,437, Cl. 266-275.000.
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,610,631, Cl. 433-228.100.

Delmege, Dale; and Rask, Richard O., to Standard Precision, Inc. Drawer slide with lock. 4,610,487, Cl. 384-18.000.

Delphia, John B. Snorkel valve assembly. 4,610,246, Cl. 128-201.110.

de Marancour, Bernard M.: *See—*
Broyer, Julien; and de Marancour, Bernard M., 4,610,262, Cl. 135-23.000.

Demarest, Henry M., Jr.: *See—*
Matesa, Joseph M.; Won, Kwang J.; and Demarest, Henry M., Jr., 4,610,711, Cl. 65-134.000.

Demus, Dietrich: *See—*
Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, 4,610,805, Cl. 252-299.620.

Denius, Homer R., Jr. Assembly and method for producing specific optical interference patterns. 4,610,511, Cl. 350-402.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamada, Mitsunori; Ishii, Masaji; Miyai, Akira; Nakajima, Yukihiko; and Sato, Shinsei, 4,610,858, Cl. 423-342.000.

Denkoh Co., Ltd.: *See—*
Mizushina, Youichi, 4,610,628, Cl. 432-241.000.

Dennard, David G. Hat/tote bag combination article. 4,610,038, Cl. 2-209.100.

Dennison Manufacturing Company: *See—*
Smith, Donald R.; and Boyd, Mary G., 4,610,744, Cl. 156-235.000.

Densow, David C., to Medical Engineering Corporation. Ureteral stent. 4,610,657, Cl. 604-8.000.

Depel, William A.; Weinberg, Bernd; and Moon, Jerald B., to Purdue Research Foundation; and Bivona Surgical Instruments, Inc. Voice prosthesis device. 4,610,691, Cl. 623-9.000.

DePriest, Robert N., to Ethyl Corporation. Metal alkyl process. 4,611,071, Cl. 556-70.000.

Derencsenyi, Tibor T., to Raychem Corporation. Method of processing a fluoroelastomer composition. 4,611,018, Cl. 524-130.000.

Derivaz, Charles, to Samvaz S.A. Cutting tool with removable blades. 4,610,285, Cl. 144-231.000.

Derouane, Eric G.: *See—*
Valyocsik, Ernest W.; and Derouane, Eric G., 4,610,855, Cl. 423-328.000.

Derrico, Gene A.: *See—*
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,610,951, Cl. 430-313.000.

de Ruiter, Ernest: *See—*
von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 4,610,905, Cl. 428-90.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Method for transferring parts from a first conveyor to a receptacle on a second conveyor. 4,610,126, Cl. 53-475.000.

De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., to Agfa-Gevaert N.V. Toner dispensing control. 4,610,532, Cl. 355-14.00D.

Desjardins, Donald A.: *See—*
England, John R.; and Desjardins, Donald A., 4,610,317, Cl. 175-331.000.

Deutsch-Franzosisches-Forschungsinstitut: *See—*
Bauer, Francois, 4,611,260, Cl. 361-233.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Lambrecht, Heinrich, 4,610,623, Cl. 431-243.000.

Deutscher, Hans-Joachim: *See—*
Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, 4,610,805, Cl. 252-299.620.

DeVries, Coos: *See—*
Giacometti, Alberto M.; Gruijs, Hans; and DeVries, Coos, 4,611,324, Cl. 370-97.000.

Dhein, Rolf: *See—*
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, 4,611,034, Cl. 525-420.000.

Diafoil Company, Limited: *See—*
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, 4,610,833, Cl. 264-235.800.

Dibert, Grant, Jr.; and Shelton, David, to Kent Subsidiary of Kidde Inc. Medicine cabinet assembly and method of mounting same. 4,610,489, Cl. 312-227.000.

DiCarlo-Cottone, Melchior J.: *See—*
Asmuth, Richard L.; DiCarlo-Cottone, Melchior J.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Raj-karne, Dattatraya G.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,096, Cl. 179-18.00B.

Dick, Larry C.; and Scott, Ernest R., to Scott & Fetzer Company, The. Vacuum cleaner of interchangeable attachment type. 4,610,047, Cl. 15-319.000.

Dick, Richard: *See—*
Galzy, Pierre; Moulin, Guy; Dick, Richard; and Mavel, Gerard, 4,610,887, Cl. 426-490.000.

Diehl, Walter: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,610,631, Cl. 433-228.100.

Diercks, George F., Jr. Automatic weight selector. 4,610,449, Cl. 272-118.000.

Diesel Kiki Co., Ltd.: *See—*
Kushida, Takeo; Chiyoda, Tsuneyuki; and Yamada, Keiichi, 4,610,233, Cl. 123-458.000.
Sakuranaka, Toru, 4,610,234, Cl. 123-502.000.

Dietz, Hans W.: *See—*
Kommoss, Klaus; Klos, Karl; Dietz, Hans W.; and Koppeler, Thomas H. W., 4,611,254, Cl. 360-69.000.

DiGiantommaso, Michael: *See—*
Santangelo, John A.; and DiGiantommaso, Michael, 4,610,242, Cl. 128-4.000.

Digital Equipment Corporation: *See—*
DiNitto, Robert S.; Porcher, Thomas C.; and Eng, John W., 4,611,202, Cl. 340-724.000.
McNamara, John E., 4,611,326, Cl. 371-47.000.

Dikstein, Shabtay; and Hartzshtark, Abraham, to Yissum Research Development Company of the Hebrew University of Jerusalem. Compositions containing 1α-hydroxycholecalciferol for topical treatment of skin disorders and methods employing same. 4,610,978, Cl. 514-46.000.

Dildine, Robert G., to Hewlett-Packard Company. Signal demodulator using a multiplying digital-to-analog converter. 4,611,177, Cl. 329-50.000.

Dill, Hans G.: *See—*
Minahan, Joseph A.; Ralph, Eugene L.; and Dill, Hans G., 4,610,077, Cl. 29-572.000.

Dilts, David A.: *See—*
Catella, Gary C.; Cull, Ronald C.; Dilts, David A.; Koch, Paul E.; and Hartman, Robert A., 4,611,090, Cl. 136-251.000.

Di Luco, Eugene. Universal ribbon spool for typewriters and other machines. 4,610,555, Cl. 400-243.000.

DiNinno, Frank P.; Leanza, William J.; and Ratcliffe, Ronald W., to Merck & Co., Inc. Process for preparing substituted 2-thioxopenams and 2-substituted thiopenems. 4,610,823, Cl. 540-350.000.

DiNitto, Robert S.; Porcher, Thomas C.; and Eng, John W., to Digital Equipment Corporation. Split screen smooth scrolling arrangement. 4,611,202, Cl. 340-724.000.

Directional Enterprises, Inc.: *See—*
Beakley, Billy, 4,610,320, Cl. 175-409.000.

DiRienz, Keith A., to Smith International, Inc. Belleville seal for sealed bearing rotary cone rock bits. 4,610,452, Cl. 277-83.000.

Dirmeyer, Josef; Kinzler, Hans; Lahner, Karlheinz; and Schulz, Hans-Werner, to Siemens Aktiengesellschaft. Electrical noise filter. 4,611,185, Cl. 333-167.000.

Discovision Associates: *See—*
Winslow, John S., 4,611,318, Cl. 369-54.000.

Dr. Johannes Heidenhain GmbH: *See—*
Feichtinger, Kurt, 4,611,156, Cl. 318-632.000.

Doddi, Namassivaya: *See—*
Beard, Charles D.; Doddi, Namassivaya; and Yamada, Akira, 4,611,061, Cl. 548-260.000.

Doi, Takashi: *See—*
Ogata, Mikito; Mori, Masahito; Doi, Takashi; and Miyazaki, Michio, 4,611,314, Cl. 369-32.000.

Dokos, John H.: *See—*
Teng, James; and Dokos, John H., 4,610,888, Cl. 426-569.000.

Dolizy, Pierre; Groliere, Francoise; and Maniguet, Francois, to U.S. Philips Corporation. Photoelectric detection structure having substrate with controlled properties. 4,611,114, Cl. 250-211.00R.

Dominion Chain Inc.: *See—*
Lane, Raymond P., 4,610,594, Cl. 414-71.000.

Donaruma, Lorraine G.: *See—*
Martin, Fred D.; Hatch, Melvin J.; Shepitka, Joel S.; and Donaruma, Lorraine G., 4,610,305, Cl. 166-275.000.

Dong, Walter; and Friend, Peter S., to Shell Oil Company. Chiral cyanohydrination process. 4,611,076, Cl. 558-351.000.

Dong, Walter; and Stoutamire, Donald W., to Shell Oil Company. Increasing enantiomeric selectivity in chiral cyanohydrination. 4,611,077, Cl. 558-351.000.

Donn, Vittorio; and Bertetti, Paolo, to RIV-SKF Officine di Villar Perosa S.p.A. Belt stretcher unit designed for assembly on a flexible drive particularly on a motor vehicle. 4,610,645, Cl. 474-112.000.

Dorflinger, Peter. Pull-up curtain with pull-up device. 4,610,290, Cl. 160-84.00R.

Dorfman, Leslie J.: *See—*
McGill, Kevin C.; and Dorfman, Leslie J., 4,611,284, Cl. 364-417.000.

Doscher, Todd M. Heavy oil recovery by high velocity non-condensible gas injection. 4,610,304, Cl. 166-261.000.

Dougherty Brothers Company: *See—*
Buehler, John D., 4,610,374, Cl. 222-83.000.
Karkiewicz, Kenneth G., 4,610,371, Cl. 220-266.000.

Dow Chemical Company, The: *See—*
Beaver, Richard N.; Dang, Hiep D.; and Newton, H. Gene, 4,610,765, Cl. 204-128.000.
Birdwell, Jeffrey D., 4,610,762, Cl. 204-1.00R.
Elder, Charles D.; and Reder, Thomas E., 4,610,166, Cl. 73-818.000.
Hefner, Robert E., Jr.; and Haynes, Deborah I., 4,611,015, Cl. 523-408.000.
Hefner, Robert E., Jr., 4,611,022, Cl. 524-325.000.
Kar, Kishore K., 4,610,797, Cl. 252-35.000.
McKinney, Osborne K.; and Flores, David P., 4,611,017, Cl. 524-119.000.
Meyer, Louis W.; McKinney, Linda M.; and Kelley, Don H., 4,611,044, Cl. 528-56.000.
Tanberg, Dennis A., 4,610,845, Cl. 422-51.000.

Dow Corning Corporation: *See—*
Rivers-Farrell, Stacia A.; and Wright, Antony P., 4,611,042, Cl. 528-32.000.

Dowbenko, Rostyslaw: *See—*
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,611,026, Cl. 524-548.000.

Dowell, William T.: *See—*
Seaborn, Douglas K.; and Dowell, William T., 4,610,059, Cl. 28-187.000.

Draayer, Johannes, to GTE Communication Systems Corporation. Arrangement for an electromechanical space switching network. 4,611,204, Cl. 340-825.800.

Draper Corporation: *See—*
Krause, Alvan A., 4,610,277, Cl. 139-191.000.

Dreyer, William J.: *See—*
Hood, Leroy E.; Hunkapiller, Michael W.; Dreyer, William J.; Hewick, Rodney M.; and Stark, Anton W., 4,610,847, Cl. 422-102.000.

Dreyfuss, Wilfried: *See—*
Remp, Thomas E.; Dreyfuss, Wilfried; and Muller, Kurt, 4,610,362, Cl. 211-59.400.

Dril-Quip, Inc.: *See—*
Reimert, Larry E., 4,610,467, Cl. 285-24.000.

Dubos, Jean-Michel: *See—*
Veaux, Jacques; Dubos, Jean-Michel; and Woerner, Pierre, 4,610,411, Cl. 244-50.000.

Dubost, Bruno, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Method of modulated cooling to minimize deformation of flat metallurgical products. 4,610,735, Cl. 148-128.000.

Dubowicz, Palemon W.: *See—*
Campbell, Donn V.; Dubowicz, Palemon W.; and Schwering, Felix, 4,611,214, Cl. 343-790.000.

Duboz, Georges: *See—*
Larue, Jean-Pierre; Duboz, Georges; Carsac, Claude; and Marhic, Gerard, 4,611,109, Cl. 219-121.0PY.

Duc, Francois. Double-flow dehydrating tunnel. 4,610,098, Cl. 34-209.000.

Duchin, Daniel, to Monarch Marking Systems, Inc. Tag dispensing and attaching apparatus. 4,610,384, Cl. 227-67.000.

Duchin, Daniel, to Monarch Marking Systems, Inc. Tag dispensing and attaching apparatus. 4,610,385, Cl. 227-67.000.

Dudley, Catherine M.; and Remedios, Thomas A., to Pitney Bowes Inc. Bus grant circuit. 4,611,297, Cl. 364-900.000.

Duffy, Dennis M.; and Small, Gary G. Fluid level sensor. 4,610,165, Cl. 73-317.000.

Duhaime, Paul M.: *See—*
Giorgio, Paul J.; and Duhaime, Paul M., 4,611,098, Cl. 179-84.00C.

Duncan, Bobby D.: *See—*
Phillips, Bobby M.; and Duncan, Bobby D., 4,610,060, Cl. 28-246.000.

Dunn, James J., to Chicago Metallic Corporation. Perimeter clip. 4,610,562, Cl. 403-233.000.

Dunne, Brian B.; and Walsh, John M. Method and apparatus for generating a high-speed metallic jet. 4,610,204, Cl. 102-476.000.

Dunne, Stephen R.: *See—*
Miller, William C.; Dunne, Stephen R.; and Ausikaitis, Joseph P., 4,610,700, Cl. 55-35.000.

Dunnington Co.: *See—*
Renzetti, Robin, 4,610,110, Cl. 51-168.000.

Dunweg, Gustav: *See—*
Henne, Werner; and Dunweg, Gustav, 4,610,791, Cl. 210-490.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bond, William B., 4,610,925, Cl. 428-368.000.
Chenard, Bertrand L., 4,611,001, Cl. 514-407.000.
Spencer, Dudley W. C., 4,610,670, Cl. 604-29.000.

Durbin, James W., to Canevari Timber Co. Method and system for rearranging data records in accordance with keyfield values. 4,611,310, Cl. 365-230.000.

Duret, Francois; Duret nee Michallet, Elisabeth; and Thermoz, Christian. Apparatus for taking odontological or medical impressions. 4,611,288, Cl. 364-474.000.

Duret nee Michallet, Elisabeth: *See—*
Duret, Francois; Duret nee Michallet, Elisabeth; and Thermoz, Christian, 4,611,288, Cl. 364-474.000.

Durham, Donald; Glick, J. Leslie; Fodge, Douglas W.; and Swann, Wayne E., to Genex Corporation. Method for unclogging drainage pipes. 4,610,800, Cl. 252-174.120.

Duringer, Rudi H., to S. Franzen Sohne (GmbH & Co.). Combination lock for the securing of skis, bicycles or the like. 4,610,152, Cl. 70-30.000.

Durr, Dieter: *See—*
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,610,980, Cl. 514-94.000.

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Dwyer, George F., Jr.: *See—*
Lewis, Robert T.; Dwyer, George F., Jr.; and Payne, John W., 4,610,432, Cl. 256-65.000.

Dyckerhoff & Widmann Aktiengesllschaft: *See—*
Schambeck, Herbert; Hilliges, Dieter; and Foerst, Hans, 4,610,117, Cl. 52-227.000.

Dyer, Martyn R.: *See—*
Brockhurst, David M.; Vivian, Roy H.; Dyer, Martyn R.; and Day, Stephen, 4,611,227, Cl. 358-147.000.

Dynachem Corporation: *See—*
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,610,951, Cl. 430-313.000.

Dynamit Nobel AG: *See—*
Heinzelmann, Walter, 4,611,008, Cl. 514-470.000.

E. R. Squibb & Sons, Inc.: *See—*
Das, Jagabandhu, 4,611,005, Cl. 514-468.000.
Das, Jagabandhu, 4,611,006, Cl. 514-468.000.
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Jain, Nemichand B.; Gertie, Linda P.; and Rudnic, Edward M., 4,610,870, Cl. 424-19.000.
Ondetti, Miguel A., 4,611,002, Cl. 514-419.000.
Truner, Uwe D., 4,610,824, Cl. 540-355.000.

E-Systems, Inc.: *See—*
King, Dennis D.; and Dautel, David F., 4,610,549, Cl. 368-113.000.

Eagle Electric Mfg. Co., Inc.: *See—*
Arora, Guru B., 4,611,192, Cl. 337-165.000.

East, John; and Maxwell, Ian. Continuous extrusion of metals. 4,610,725, Cl. 75-228.000.

Eastman, Curtis R., to Lagrison Industries Ltd. Filling attachment for a feed tube. 4,610,344, Cl. 193-5.000.

Eastman Kodak Company: *See—*
Chen, Janglin; Kelly, James E.; and Plakunov, James, 4,610,955, Cl. 430-527.000.
Guardino, Robert F.; and Belly, Robert T., 4,610,961, Cl. 435-34.000.
McClure, Richard J., 4,611,249, Cl. 360-77.000.
Phillips, Bobby M.; and Duncan, Bobby D., 4,610,060, Cl. 28-246.000.
Schultz, Peter G., 4,610,068, Cl. 29-418.000.
Steklenski, David J.; Upson, Donald A.; and Low, Howard M., 4,611,027, Cl. 524-815.000.

Eastman, Robert J.; and Goodspeed, Henry S., to Manville Service Corporation. Roofing membranes and system. 4,610,902, Cl. 428-57.000.

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Morgan, Paul W., 4,610,168, Cl. 73-862.350.

Eaton, Harry E.; Novak, Richard C.; and Matarese, Alfred P., to United Technologies Corporation. Abrasive surface coating process for superalloys. 4,610,698, Cl. 51-295.000.

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Ebert, Charles; and Viertel, Lothar, to Gebr. Happich GmbH. Sun visor and method for the manufacture thereof. 4,610,443, Cl. 296-97.00H.

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Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink reservoir. 4,610,202, Cl. 101-364.000.

Eckert, Karlheinz: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,610,631, Cl. 433-228.100.

Eckstein, Udo: *See—*
Brinkwerth, Wolfgang; and Eckstein, Udo, 4,610,807, Cl. 252-301.210.

Eda, Hiroshi: *See—*
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.

Edakubo, Hiroo: *See—*
Ushiro, Tatsuzo; Narasawa, Takashi; Fujiki, Makoto; and Edakubo, Hiroo, 4,611,255, Cl. 360-84.000.

Eder, Robert L.; and Ray, Donald L., to Emhart Industries, Inc. Means providing intermittent motion to a cam means of a timing mechanism and having sub-interval switching means. 4,611,103, Cl. 200-38.00B.

Effenberger, John A.; Ribbans, Robert C., III; and Keese, Frank M., to Chemical Fabrics Corporation. Novel wear resistant fluoropolymer-containing flexible composites. 4,610,918, Cl. 428-245.000.

Efrom, Harriet. Protection assembly for abdominal area. 4,610,463, Cl. 280-751.000.

EG&G Mason Research Institute: *See—*
Bogden, Arthur E., 4,610,869, Cl. 424-9.000.

Eglise, David, to Mars, Inc. Data collection system. 4,611,205, Cl. 340-825.350.

EGO Elektro-Gerate Blanc und Fischer: *See—*
Schreder, Felix, 4,611,112, Cl. 219-455.000.

Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, to Kubota, Ltd. Combine harvester. 4,610,127, Cl. 56-14.600.

Eiermann, Kurt: *See—*
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Lambropoulos, George P.; Charboneau, Benjamin J.; and Eilola, David H., 4,611,154, Cl. 318-490.000.

Eisbrenner, Dietrich; and Merk, Hans, to Licentia Patent-Verwaltungs-GmbH. Method for producing a directed aerosol stream. 4,610,892, Cl. 427-27.000.

Eitenmuller, Jurgen; Rackur, Helmut; Wimmer, Walter; and Weiss, Marija, to Mundipharma GmbH. Implant for filling bone cavities and fixing bone fragments in a living body, method of producing the same, and bone implant system. 4,610,692, Cl. 623-16.000.

Ekholm, Pertti; and Kaukanen, Esko, to Labsystems Oy. Method for the dilution of liquid samples. 4,610,170, Cl. 73-864.220.

Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, to Lannen Tehtaat Oy. Paper that contains chemically substituted cellulose. 4,610,761, Cl. 162-157.600.

Elan Corporation, P.L.C.: *See—*
Panoz, Donald E.; and Corrigan, Owen I., 4,610,875, Cl. 424-80.000.

Elastomeros Riojanos S.A.: *See—*
Elvira, Victorino V., 4,610,907, Cl. 428-122.000.

Elder, Charles D.; and Reder, Thomas E., to Dow Chemical Company, The. Method and apparatus for testing welds in plastic pipe. 4,610,166, Cl. 73-818.000.

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Koltuniak, Thomas A.; and Lawrence, William A., 4,610,388, Cl. 228-6.200.

Electric Power Research Institute: *See—*
Appleby, Anthony J., 4,610,938, Cl. 429-42.000.

Electricite de France: *See—*
Darbois, Claudine, 4,610,069, Cl. 29-421.00M.

Electricity Council, The: *See—*
Lillicrap, Douglas C., 4,611,338, Cl. 373-161.000.

Elf France: *See—*
Bernasconi, Christian; Llinares, Michel; and Nouguier, Robert, 4,610,696, Cl. 44-56.000.
Gueguen, Claude; Figueras, Francois; and Fajula, Francois, 4,611,086, Cl. 568-897.000.

Elliot, Eric, to AutoSystems Limited. Conveyor and associated control system for sorting poultry carcasses. 4,610,361, Cl. 209-555.000.

Elliott Turbomachinery Co., Inc.: *See—*
Cline, William F., 4,610,066, Cl. 29-252.000.

Elsner, Norbert B.; Bass, John C.; and Morris, Charles C., to GA Technologies Inc. Thermoelectric converter. 4,611,089, Cl. 136-230.000.

Eltech Systems Corporation: *See—*
King, Harry L., 4,610,726, Cl. 75-233.000.

Elvira, Victorino V., to Elastomeros Riojanos S.A. Metal core of sections for automovile and similar vehicles. 4,610,907, Cl. 428-122.000.

Emerson Electric Co.: *See—*
Damon, Billy L.; and Kliethermes, Andrew J., 4,610,278, Cl. 140-92.100.

Emhart Corporation: *See—*
Hawkswell, Victor T., 4,610,473, Cl. 294-64.100.

Emhart Industries, Inc.: *See—*
Eder, Robert L.; and Ray, Donald L., 4,611,103, Cl. 200-38.00B.
Keller, Rene ; and Merz, Steven G., 4,610,712, Cl. 65-158.000.

Emmert, Raymond L. Quick connect and release buckle. 4,610,056, Cl. 24-197.000.

Emory, John E., Jr., to Big Jon, Inc. Tip up rigger with trolley subassembly. 4,610,409, Cl. 242-106.000.

Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge: *See—*
Hofmann, Hans; and Ziegler, Heinz, 4,610,441, Cl. 269-48.100.

Endlish, Mark E.: *See—*
Olson, Kurt G.; Blackburn, William P.; and Endlish, Mark E., 4,611,040, Cl. 526-279.000.

Endo, Kazunaka: *See—*
Kanada, Eiji; Endo, Kazunaka; Yamamoto, Kyonosuke; and Suzuki, Shigeyoshi, 4,610,949, Cl. 430-301.000.

Endo, Yoshishige: *See—*
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.

Endoh, Hiroshi: *See—*
Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, 4,611,335, Cl. 375-110.000.

Endress u. Hauser GmbH u. Co.: *See—*
Seibert, Frank; and Wetzel, Gustav, 4,611,117, Cl. 250-252.100.

Eng, John W.: *See—*
DiNitto, Robert S.; Porcher, Thomas C.; and Eng, John W., 4,611,202, Cl. 340-724.000.

Engel, Dieter; Mondt, Josef; and Rinno, Helmut, to Hoechst Aktiengesellschaft. Process for bake coating the surfaces of solid substances. 4,610,898, Cl. 427-379.000.

Engel, James R.; Bruckert, Eugene J.; and Thro, Stuart W., to Motorola, Inc. Message capturing radio data system. 4,611,334, Cl. 375-100.000.

Engelmann, Rainer: *See—*
Baudis, Ulrich; Biberbach, Peter; and Engelmann, Rainer, 4,610,437, Cl. 266-275.000.

England, John R.; and Desjardins, Donald A., to Inco Limited. Spherical bit. 4,610,317, Cl. 175-331.000.

Engle, George M.; and Rosler, Richard S., to Advanced Semiconductor Materials of America, Inc. Apparatus for processing semiconductor wafers or the like. 4,610,748, Cl. 156-345.000.

Enhart Corporation: *See—*
Yardley, Robert; Cameron, Ewen R.; and Wolloff, Frank H., 4,610,041, Cl. 12-55.100.

Erhardt, Manfred, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Single-tooth cutter for sloping the faces of the teeth of gears. 4,610,576, Cl. 407-21.000.

Erickson, Mervin L. Selectively free wheeling or drive hub for vehicles. 4,610,558, Cl. 403-1.000.

Eriksson, Erik, to ASEA Aktiebolag. Tool holder for industrial robots. 4,610,075, Cl. 29-568.000.

Eriksson, Sven; Halldahl, Lars; and Kohrtz, Sven-Ake, to Asea Aktiebolag. Method of manufacturing an absorber plate for a boiling water reactor. 4,610,893, Cl. 427-34.000.

Erkkila, Jukka: *See—*
Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, 4,610,761, Cl. 162-157.600.

Ermacora, Rino, to Kuhn, S.A. Fodder conditioning devices. 4,610,128, Cl. 56-16.400.

Ermann, Renato M.: *See—*
Asmuth, Richard L.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,094, Cl. 179-7.1TP.
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Ermer, James H.: *See—*
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., 4,611,091, Cl. 136-260.000.

Ernst Leitz Wetzlar GmbH: *See*—
Keiner, Heinz, 4,610,476, Cl. 294-149.000.
Ruhl, Friedel, 4,610,524, Cl. 354-274.000.
Ernst, Volker; and Opower, Hans, to W. C. Heraeus GmbH. Gas laser. 4,611,329, Cl. 372-88.000.
Erratico, Pietro; and Menniti, Pietro, to SGS-ATES Componenti Elettronici SpA. Parallel voltage regulators with different operating characteristics collectively forming a single regulator with wide operating range. 4,611,162, Cl. 323-269.000.
Esanu, Andre , to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.). 5-(1-cyano-1-alkyl-N-methyl-N-methoxyphenethyl)-alkylamino-2,2,8-trimethyl-4H-dioxino-(4,5-c)-pyridine derivatives, and their use as calcium antagonistic agents. 4,610,990, Cl. 514-302.000.
Esch, Frederick S.: *See*—
Bohlen, Peter; Esch, Frederick S.; Ling, Nicholas C.; Brazeau, Paul E., Jr.; and Guillemin, Roger C. L., 4,610,976, Cl. 514-12.000.
Eschenbach, Paul W.; and Goineau, Andre M., to Milliken Research Corporation. Method of forming air textured boucle yarn. 4,610,131, Cl. 57-6.000.
Eschler, Dieter, to Paul Hartmann Aktiengesellschaft. Apparatus for separating and applying of sections of strips on areas of a material web lying at a distance one behind the other. 4,610,751, Cl. 156-517.000.
Estes, Ann E.; and Staczek, Donald J., to Owens-Illinois, Inc. Round juice bottle formed from a flexible material. 4,610,366, Cl. 215-1.00C.
ETA S.A. Fabriques d'Ebauches: *See*—
Thomke, Ernst; and Muller, Jacques, 4,610,550, Cl. 368-281.000.
Ethyl Corporation: *See*—
DePriest, Robert N., 4,611,071, Cl. 556-70.000.
Everly, Charles R., 4,611,075, Cl. 558-351.000.
Ihrman, Kryn G., 4,611,045, Cl. 528-76.000.
Laurent, Sebastian M.; and Sanders, Robert N., 4,610,882, Cl. 424-154.000.
Laurent, Sebastian M.; and Sanders, Robert N., 4,610,883, Cl. 424-154.000.
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, to Beecham Group p.l.c. Trans-4-(2-thiaoxo-1-pyrrolidinyl or piperidinyl)-2H-benzo[b]pyran-3-ol derivatives useful in treating hypertension. 4,610,992, Cl. 514-320.000.
Evans, Michael W., to General Electric Company. Minimal logic synchronous up/down counter implementations for CMOS. 4,611,337, Cl. 377-123.000.
Everly, Charles R., to Ethyl Corporation. Preparation of 4-(α,α-dihydrocarbyl-α-cyano-methyl)phenols. 4,611,075, Cl. 558-351.000.
Ewalt, Paul R.; Leigh, Harold G.; and Gilson, Richard W., to Sherwood Medical Company. Syringe locking device. 4,610,672, Cl. 604-220.000.
Ex-Cell-O Corporation: *See*—
Carene, Nicholas J., Jr., 4,610,154, Cl. 72-88.000.
Gray, John D., 4,610,620, Cl. 425-434.000.
Exxon Chemical Patents Inc.: *See*—
Lipscomb, Robert L.; Cargle, Virgil H.; and Bausano, Domenick, 4,610,897, Cl. 427-212.000.
Exxon Production Research Co.: *See*—
Finn, Lyle D.; and Maus, Leo D., 4,610,569, Cl. 405-202.000.
Gehrig, George F.; and Speers, Jerry M., 4,610,161, Cl. 73-155.000.
Exxon Research and Engineering Co.: *See*—
Markley, Gerald E.; and Spry, James C., Jr., 4,610,779, Cl. 208-212.000.
F.lli Cucchi S.r.l.: *See*—
Cucchi, Giovanni; and Cucchi, Pietro, 4,610,591, Cl. 414-14.000.
Fabiny, William J.: *See*—
Mosser, Mark F.; and Fabiny, William J., 4,610,929, Cl. 428-421.000.
Fagerroos, Mauno O. Dry cleaning box. 4,610,113, Cl. 51-425.000.
Fahlen, Theodore S.: *See*—
Clark, David J.; and Fahlen, Theodore S., 4,611,327, Cl. 372-58.000.
Fahnler, Friedrich: *See*—
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, 4,611,034, Cl. 525-420.000.
Fairchild Camera and Instrument Corporation: *See*—
McDonald, Duncan R., 4,611,123, Cl. 250-551.000.
Fajula, Francois: *See*—
Gueguen, Claude; Figueras, Francois; and Fajula, Francois, 4,611,086, Cl. 568-897.000.
Falz, Ulrich; Lunke, Manfred; and Walter, Jurgen, to Hackforth GmbH & Co. KG. Ring segment connection arrangement for link coupling. 4,610,642, Cl. 464-69.000.
Fanuc Ltd.: *See*—
Katsube, Hideo; and Aso, Toshiyuki;, 4,610,074, Cl. 29-568.000.
Kurakake, Mitsuo, 4,611,155, Cl. 318-603.000.
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,611,159, Cl. 318-803.000.
Farmer, Donald J.; and Powell, Joseph F., III, to Colt Industries Operating Corp. Electrical bushing having a replaceable stud. 4,611,093, Cl. 174-152.00R.
Favorite Manufacturing, Inc.: *See*—
Martin, Eugene G.; and Lease, Michael E., 4,610,051, Cl. 17-11.000.
Fazekas, Peter; and Otto, Johann, to Siemens Aktiengesellschaft. Method of emphasizing a subject area in a scanning microscope. 4,611,119, Cl. 250-307.000.
Fazio, Dominick: *See*—
Schneider, Helmut A.; and Fazio, Dominick, 4,610,445, Cl. 271-160.000.
Federal-Mogul Corporation: *See*—
Tannery, Reinhard G., 4,610,095, Cl. 33-517.000.
Feichtinger, Kurt, to Dr. Johannes Heidenhain GmbH. Method and apparatus for determining the position or dimensions of a test object. 4,611,156, Cl. 318-632.000.
Fejes, Erno : *See*—
Czeiler, Andras; Keri, Miklos; Balogh, Bela; Fejes, Erno ; Kallai, Istvan; and Lukacs, Sandor, 4,610,217, Cl. 118-47.000.
Fellmeth, Gunther; and Jester, Willi, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Chuck for use with a cutting tool. 4,610,585, Cl. 409-233.000.
Ferguson, Edward, to Tomy Kogyo Co. Inc. Toy vehicle having rotating element. 4,610,637, Cl. 446-237.000.
Fernandez, Antonio, to RCA Corporation. Pipelined successive approximation analog-to-digital converter. 4,611,196, Cl. 340-347.0AD.
Ferranti plc: *See*—
Wilson, Geoffrey C., 4,610,758, Cl. 156-656.000.
Ferrer Internacional, S.A.: *See*—
Foguet, Rafael; Forne, Ernesto; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,610,998, Cl. 514-399.000.
Ferriss, Lincoln S., to Singer Company, The. Electronic dither compensator for a ring laser gyro. 4,610,543, Cl. 356-350.000.
Fiber Bond Corporation: *See*—
Kent, James, 4,610,919, Cl. 428-285.000.
Fichtel & Sachs AG: *See*—
Scheer, Erich, 4,610,342, Cl. 192-70.280.
Figard, Joseph E.: *See*—
Kolts, John H.; Figard, Joseph E.; Kimble, James B.; and Kubicek, Donald H., 4,610,766, Cl. 204-157.520.
Figueras, Francois: *See*—
Gueguen, Claude; Figueras, Francois; and Fajula, Francois, 4,611,086, Cl. 568-897.000.
Fillingame, Gary P.: *See*—
Bornstein, Leopold F., deceased; and Fillingame, Gary P., 4,611,020, Cl. 524-233.000.
Filter Specialists, Inc.: *See*—
Morgan, Howard W.; and Hartog, Ronald L., 4,610,787, Cl. 210-239.000.
Finck, Johan C. J.: *See*—
Broer, Dirk J.; and Finck, Johan C. J., 4,610,746, Cl. 156-275.500.
Findlay, John W. A.: *See*—
Coker, Geoffrey G.; and Findlay, John W. A., 4,610,995, Cl. 514-343.000.
Fink, Reinhold; and Leuchte, Michael, to Andreas Stihl. Crankcase assembly for an engine of a portable tool. 4,610,228, Cl. 123-195.00R.
Fink, Reinhold: *See*—
Wissmann, Michael; Nickel, Hans; Fink, Reinhold; and Leuchte, Michael, 4,610,229, Cl. 123-195.00R.
Finn, Lyle D.; and Maus, Leo D., to Exxon Production Research Co. Hybrid offshore structure. 4,610,569, Cl. 405-202.000.
Firestone Tire & Rubber Company, The: *See*—
Moosavian, Seid H., 4,610,768, Cl. 203-14.000.
Firetrol, Inc.: *See*—
Henningsen, Lee A.; and Gardiner, Quentin J., 4,611,290, Cl. 364-510.000.
Firmenich SA: *See*—
Schulte-Elte, Karl-Heinrich; Muller, Bernard L.; and Pamingle, Herve , 4,610,813, Cl. 252-522.00R.
Fischer, Robert R.; and Urschel, Joe R., to Urschel Laboratories Incorporated. Comminuting equipment. 4,610,397, Cl. 241-86.000.
Fitzi, Karl: *See*—
Fuchs, Ernst; Berger, Eduard; and Fitzi, Karl, 4,610,281, Cl. 140-140.000.
Fleig, John A. Preselected multiple dosage syringe. 4,610,668, Cl. 604-208.000.
Fleiter, Albert: *See*—
Pfau, Hans; and Fleiter, Albert, 4,610,435, Cl. 266-250.000.
Flight Connector Corporation: *See*—
Schwartz, Lawrence; Kilsdonk, Jan A.; and Steele, Jerry T., 4,610,496, Cl. 339-91.00B.
Flinders University of South Australia, The: *See*—
Baker, Bruce G.; Clark, Neville J.; McArthur, Hamish; and Summerville, Edward, 4,610,975, Cl. 502-302.000.
Flores, David P.: *See*—
McKinney, Osborne K.; and Flores, David P., 4,611,017, Cl. 524-119.000.
Flum, Paul; and Mynatt, Jerry M., to Paul Flum Ideas, Inc. Container assembly for storage and display of articles. 4,610,363, Cl. 211-74.000.
FMC Corporation: *See*—
Dean, William C., 4,610,049, Cl. 16-286.000.
Norris, Robert D.; Brown, Richard A.; and Brubaker, Gaylen R., 4,610,795, Cl. 252-8.551.
Fodge, Douglas W.: *See*—
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Fodor, Beno: *See*—
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Foerst, Hans: *See*—
Schambeck, Herbert; Hilliges, Dieter; and Foerst, Hans, 4,610,117, Cl. 52-227.000.
Foguet, Rafael; Forne, Ernesto; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., to Ferrer Internacional, S.A. Imidazolylethoxyindanes and use as antithrombotic agents. 4,610,998, Cl. 514-399.000.

Fogwell, Ralph L., to Board of Trustees Operating Michigan State University. Method for breeding control in female bovines. 4,610,687, Cl. 604-891.000.

Follette, Martha G., to Raychem Corporation. Wraparound closure. 4,610,921, Cl. 428-304.400.

Food Automation-Service Techniques, Inc.: *See*—
Veth, George J., 4,610,238, Cl. 126-21.00R.

Ford, James A. Process for producing particulate pigment having improved tinctorial characteristics. 4,610,395, Cl. 241-5.000.

Ford Motor Company: *See*—
Chattha, Mohinder S., 4,611,046, Cl. 528-98.000.
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Peng, Stephen C.; and Nordstrom, John D., 4,611,028, Cl. 524-850.000.
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Fellmeth, Gunther; and Jester, Willi, 4,610,585, Cl. 409-233.000.
Hallet, Peter; Hess, Erwin; and Mertens, Hans-Jurgen, 4,610,548, Cl. 366-279.000.
Hartwig, Jurgen; and Pant, Paul, 4,610,734, Cl. 148-120.000.
Ziese, Rolf, 4,611,313, Cl. 367-88.000.

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Yamada, Masao; and Kawakami, Haruo, 4,610,841, Cl. 376-305.000.

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Nomura, Masaaki; Nahara, Akira; and Kitamoto, Tatsuji, 4,610,903, Cl. 428-64.000.
Ono, Shigetoshi; Nakamura, Shigeru; and Matsumoto, Kazuhiko, 4,610,959, Cl. 430-598.000.
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Araihara, Satoshi, 4,610,940, Cl. 430-5.000.
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Shimura, Takaki; Murakami, Keiichi; Miwa, Hirohide; Sato, Takuso; and Ichida, Nobuyuki, 4,610,255, Cl. 128-660.000.

Fujiwara, Hideo: *See*—
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Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Liquid crystal display cell having stepped substrate ends and method for manufacture thereof. 4,610,510, Cl. 350-334.000.

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Furukawa, Toshio, to Sharp Kabushiki Kaisha. Pulse measurement system. 4,610,257, Cl. 128-689.000.

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Manabe, Akio; Hisada, Yoshio; and Furuzawa, Kunihiko, 4,610,997, Cl. 514-397.000.

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Elsner, Norbert B.; Bass, John C.; and Morris, Charles C., 4,611,089, Cl. 136-230.000.

Gabrielli, Luciano; Lotito, Nicola; and Sposini, Maurizio, to CSELT—Centro Studi e Laboratori Telecommunicazioni S.p.A. Variable-band distributed switching node with dynamic hybrid-frame processing. 4,611,321, Cl. 370-60.000.

Gaida, Walter E.; and Kun, Zoltan K., to Westinghouse Electric Corp. Method for growing crystals. 4,610,754, Cl. 156-601.000.

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Veltri, Richard D.; and Galasso, Francis S., 4,610,896, Cl. 427-140.000.

Galloway, Michael D.; Rose, William H.; and Shaffer, David T., to AMP Incorporated. Electrical circuit package for greeting cards. 4,611,262, Cl. 361-421.000.

Galluccio, Richard A.; Lai, Chung-Yin; and Neveu, Christian D., to Rohm and Haas Company. Process for the preparation of a compatibilizer for concentrated polymer blends and compatibilizer product. 4,611,031, Cl. 525-310.000.

Galvin, Paul H.: *See*—
Crespin, Pierre; Guay, Francois; Galvin, Paul H.; and Gouzard, Jean-Paul, 4,610,695, Cl. 44-51.000.

Galzy, Pierre; Moulin, Guy; Dick, Richard; and Mavel, Gerard, to Institut National de Recherche Chimique Appliquee. Process for concentration of fermented juices by reversed osmosis. 4,610,887, Cl. 426-490.000.

Garcia, Julio. Capsule fishing float. 4,610,104, Cl. 43-41.200.

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Garland, Robert B., to G. D. Searle & Co. Method for preparing 5-fluoroprostacyclins. 4,611,065, Cl. 549-214.000.

Garnham, Robert L. Vehicle attachable carrier. 4,610,458, Cl. 280-495.000.

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Ebert, Charles; and Viertel, Lothar, 4,610,443, Cl. 296-97.00H.
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Geer, Linda L.; and Knowles, Steven M., to Aeroquip Corporation. Convertible flare/braze fitting. 4,610,466, Cl. 285-12.000.

Gehrig, George F.; and Speers, Jerry M., to Exxon Production Research Co. Method and apparatus for determining fluid circulation conditions in well drilling operations. 4,610,161, Cl. 73-155.000.

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Bosso, Joseph F.; and Geiger, William J., 4,610,769, Cl. 204-181.700.

Geka, Toshiaki, to Nippon Thompson Co., Ltd. Linear motion ball bearing structure. 4,610,488, Cl. 384-45.000.

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Baheti, Radhakisan S.; and Corby, Nelson R., Jr., 4,611,111, Cl. 219-124.340.
Banfi, Claudio, 4,611,187, Cl. 335-16.000.
Colsher, James G., 4,610,258, Cl. 128-691.000.
Crivello, James V., 4,610,952, Cl. 430-325.000.
Evans, Michael W., 4,611,337, Cl. 377-123.000.
Kindig, Alan L.; and Peters, Fredus N., III, 4,611,138, Cl. 310-71.000.
McMurray, William, 4,611,267, Cl. 363-58.000.
Miller, Timothy J. E.; and Bass, James T., 4,611,157, Cl. 318-696.000.
Mossey, Paul W., 4,610,540, Cl. 356-28.500.
Pardini, Franco P.; and Banfi, Claudio, 4,611,106, Cl. 200-147.00R.
Peters, Edward N., 4,611,048, Cl. 528-185.000.
Shah, Kirti C., 4,610,551, Cl. 374-117.000.
Ten Haagen, Christopher W., 4,611,167, Cl. 324-137.000.
Thomas, Leonard A., 4,610,498, Cl. 339-186.00R.
Williams, Eugene C.; and Pearson, Phil E., Jr., 4,611,348, Cl. 382-44.000.
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Coles, Robert E.; and Newman, Alec T., 4,610,351, Cl. 206-217.000.

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Bhagat, Jayant K., 4,611,235, Cl. 357-38.000.
Buschur, Jeffrey J.; Franklin, Ernest G.; and Shufflebarger, William S., 4,610,046, Cl. 15-250.160.
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MacIver, Bernard A., 4,611,220, Cl. 357-23.700.
Mahoney, John E., 4,610,177, Cl. 74-330.000.
Nedorezov, Joseph V., 4,610,153, Cl. 72-112.000.
Tervol, Steven A., 4,610,478, Cl. 296-214.000.
Wycech, Joseph S., 4,610,836, Cl. 264-313.000.

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Kubala, Robert; LaPolla, Anthony; Raney, Donald; and Morse, Charles W., 4,610,206, Cl. 104-26.00B.

Genex Corporation: *See*—
Durham, Donald; Glick, J. Leslie; Fodge, Douglas W.; and Swann, Wayne E., 4,610,800, Cl. 252-174.120.

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Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,610,724, Cl. 75-118.00R.

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Arnoux, Daniel; Genter, Claude; and Bousquet, Jean, 4,611,174, Cl. 324-424.000.

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Kraiss, Richard, 4,610,422, Cl. 249-94.000.

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Bornstein, Leopold F., deceased; and Fillingame, Gary P., 4,611,020, Cl. 524-233.000.

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Gerfast, Sten R. Method of making axial fan impeller. 4,610,601, Cl. 416-234.000.

Germi, Franco; and Moretti, Franco, to U.S. Philips Corporation. Refrigerator door with drink dispenser. 4,610,375, Cl. 222-131.000.

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Jain, Nemichand B.; Gertie, Linda P.; and Rudnic, Edward M., 4,610,870, Cl. 424-19.000.

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Ghassemi, Farhad; and Alexander, John D., to Conoco Inc. Infill drilling pattern. 4,610,301, Cl. 166-245.000.

Ghavamikia, Hamid, to General Motors Corporation. Method of producing glass fiber mat reinforced plastic panels with smooth surfaces. 4,610,835, Cl. 264-250.000.

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Gibson, Stanley; and Tindall, Colin, to Davidson & Company Limited. Controlling seal system in rotary regenerative air preheaters. 4,610,297, Cl. 165-9.000.

Gien, Bernard L. Truck mounted drilling machine. 4,610,314, Cl. 175-57.000.

Gilbert, Edward T.: *See—*
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Malm, Curtis L., 4,610,557, Cl. 401-75.000.

Gilson, Richard W.: *See—*
Ewalt, Paul R.; Leigh, Harold G.; and Gilson, Richard W., 4,610,672, Cl. 604-220.000.

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Glick, J. Leslie: *See—*
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Glomb, Walter L., Jr.; and Waters, James P., to United Technologies Corporation. Fluidic device. 4,610,274, Cl. 137-828.000.

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Ohnishi, Kazuhiko; and Hayashi, Masaaki, 4,611,345, Cl. 382-7.000.

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Guzzetta, Matthew. Steering system for elimination of bump steering in independent wheel suspension systems. 4,610,461, Cl. 280-660.000.
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Hafele, Harry M. Methods and fixtures for installing drapery brackets and the like. 4,610,092, Cl. 3-180.00R.
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Halstead, David K. Heat stress calculator. 4,611,113, Cl. 235-78.00R.
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Hasegawa, Yo; Murakawa, Satoshi; and Shimazaki, Yukihiro, to Matsushita Electric Industrial Co., Ltd. Radiation curable resin, paint or ink vehicle composition comprising said resin and magnetic recording medium or resistor element using said resin. 4,610,810, Cl. 252-511.000.
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Hawkswell, Victor T., to Emhart Corporation. Head and method for orienting electrical components. 4,610,473, Cl. 294-64.100.
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Heinlein, Joseph, to Lambert Consolidated Industries, Inc. End mill and method. 4,610,581, Cl. 409-132.000.
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Heiserman, David L., to Microflex Technology, Inc. Piezoelectric polymer micromanipulator. 4,610,475, Cl. 294-86.400.
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Urban, Peter; and Hilfman, Lee, 4,610,776, Cl. 208-418.000.
Hill, David L. Hand grip for push-ups. 4,610,448, Cl. 272-93.000.
Hill-Rom Company, Inc.: *See*—
Fullenkamp, Eugene H., 4,610,118, Cl. 52-240.000.
Hill, Steven C. Velcro-encapsulated label for shoes and the like. 4,610,102, Cl. 36-136.000.
Hilliges, Dieter: *See*—
Schambeck, Herbert; Hilliges, Dieter; and Foerst, Hans, 4,610,117, Cl. 52-227.000.
Hills Industries Limited: *See*—
Meade, Ronald G., 4,610,364, Cl. 211-183.000.
Hine, Shiro; and Ishikura, Hidenobu, to Mitsubishi Denki Kabushiki Kaisha. Solid-state image sensor and manufacturing process thereof. 4,611,223, Cl. 357-30.000.
Hinsken, Hans; Mayerhoefer, Horst; Mueller, Wolfgang; and Schneider, Hermann, to Ciba-Geigy Corp. Benzofuranone or indolinone compounds useful as stabilizers for organic materials. 4,611,016, Cl. 529-99.000.
Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,610,093, Cl. 33-180.0AT.
Hioki, Susumu: *See*—
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.
Hirai, Shiro: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.
Hirano, Hiroshi: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, to Daidotokushuko Kabushikikaisha. Melting cast installation. 4,610,296, Cl. 164-469.000.
Hirokane, Junji: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, 4,610,912, Cl. 428-213.000.
Hiromoto, Takenori; Hiromoto, Yoshito; and Hiromoto, Takuji. Knitted fabric, method of knitting same and machine for the same. 4,610,150, Cl. 66-115.000.
Hiromoto, Takuji: *See*—
Hiromoto, Takenori; Hiromoto, Yoshito; and Hiromoto, Takuji, 4,610,150, Cl. 66-115.000.
Hiromoto, Yoshito: *See*—
Hiromoto, Takenori; Hiromoto, Yoshito; and Hiromoto, Takuji, 4,610,150, Cl. 66-115.000.
Hirose, Toshio: *See*—
Koga, Minoru; Kizawa, Toshio; and Hirose, Toshio, 4,610,315, Cl. 175-85.000.
Hisada, Yoshiaki: *See*—
Nakamura, Kazuharu; Nakanishi, Yutaka; and Hisada, Yoshiaki, 4,610,239, Cl. 126-96.000.

Hisada, Yoshio: *See—*
Manabe, Akio; Hisada, Yoshio; and Furuzawa, Kunihiko, 4,610,997, Cl. 514-397.000.
Hishiki, Hideo; and Kamiyama, Yukio, to Victor Company of Japan, Limited. High DC voltage generator. 4,611,152, Cl. 315-411.000.
Hitachi Cable, Ltd.: *See—*
Tokunaga, Toshihide; and Kato, Masaaki, 4,610,506, Cl. 350-96.330.
Hitachi, Ltd.: *See—*
Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, 4,611,335, Cl. 375-110.000.
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.
Fujiwara, Kiyoshi; and Yoshinaga, Shoji, 4,610,852, Cl. 423-9.000.
Hamada, Toyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; Jinriki, Tatenori; and Koizumi, Kiyohide, 4,610,598, Cl. 411-744.00A.
Hanma, Kentaro; and Murakami, Toshio, 4,611,244, Cl. 358-227.000.
Hori, Ryoichi; and Ito, Kiyoo, 4,611,299, Cl. 365-189.000.
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,610,804, Cl. 252-299.100.
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Kumasaka, Noriyuki; Fujiwara, Hideo; Saito, Noritoshi; Otomo, Shigekazu; Yamashita, Takeo; and Kudo, Mitsuhiro, 4,610,935, Cl. 428-632.000.
Nagase, Hiroshi; Matsuda, Yasuo; and Ninomiya, Hisakazu, 4,611,158, Cl. 318-803.000.
Ninomiya, Takanori; and Nakagawa, Yasuo, 4,611,292, Cl. 364-559.000.
Ogata, Mikito; Mori, Masahito; Doi, Takashi; and Miyazaki, Michio, 4,611,314, Cl. 369-32.000.
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.
Sasaki, Yuko; Suzuki, Katsumi; Minato, Akira; and Yoshida, Tomio, 4,610,732, Cl. 148-6.14R.
Yokoo, Shouzou, 4,611,251, Cl. 360-85.000.
Hitco: *See—*
Mullen, Charles K., 4,610,860, Cl. 423-447.800.
Hocker, Jurgen: *See—*
Kossmehl, Gerhard; and Hocker, Jurgen, 4,611,032, Cl. 525-360.000.
Hockersmith, Thomas F.; and Wile, Donald E., to Advanced Controls, Inc. Closed loop automated workpiece handling system for machine tool. 4,610,595, Cl. 414-222.000.
Hoechst Aktiengesellschaft: *See—*
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,610,999, Cl. 514-401.000.
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,611,000, Cl. 514-401.000.
Engel, Dieter; Mondt, Josef; and Rinno, Helmut, 4,610,898, Cl. 427-379.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Davis, Larry; and Klein, Joseph T., 4,610,988, Cl. 514-253.000.
Hoelscher, James R., to General Signal Corp. Vital interface system for railway signalling. 4,611,291, Cl. 364-550.000.
Hoesch Aktiengesellschaft: *See—*
Schmidts, Klaus; Therolf, Dieter; and Weber, Ulrich, 4,610,618, Cl. 425-383.000.
Hoffman, Albert, to Linde Aktiengesellschaft. Method for separating gaseous and liquid components from a foamy gas liquid mixture. 4,610,701, Cl. 55-87.000.
Hoffman, Harry S., Jr.: *See—*
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,611,203, Cl. 340-773.000.
Hoffmann-La Roche Inc.: *See—*
Baruth, Herman W., Jr.; Berger, Leo; Corraz, Alfred J.; and Sepinwall, Jerry, 4,610,989, Cl. 514-282.000.
Hofler, Willy: *See—*
Bertz, Hans-Ulrich; and Golder, Peter, 4,610,091, Cl. 33-179.50R.
Hofmann, Hans; and Ziegler, Heinz, to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge. Expansion sleeve for applying precise circumferential stress. 4,610,441, Cl. 269-48.100.
Hogberg, Maynard G.: *See—*
Pearson, Albert M.; Brooks, Roger I.; Hogberg, Maynard G.; Pestka, James J.; and Gray, J. Ian, 4,610,877, Cl. 424-88.000.
Hogsett, Robert F.: *See—*
Duyvesteyn, Willem P. C.; and Hogsett, Robert F., 4,610,722, Cl. 75-97.00A.
Holden, John M., to Speedifix Building Components Pty. Ltd. Fasciagutter bracket assembly. 4,610,412, Cl. 248-48.200.
Hollingsworth, Michael A.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Harmon, William A.; McKenzie, Terry L.; and Hollingsworth, Michael A., 4,610,575, Cl. 406-113.000.
Hollister Incorporated: *See—*
Mohiuddin, Mahmood, 4,610,677, Cl. 604-339.000.
Schneider, Barry L.; Jensen, Marvin E.; and Mohiuddin, Mahmood, 4,610,676, Cl. 604-339.000.
Holotek Ltd.: *See—*
Kramer, Charles J., 4,610,500, Cl. 350-3.710.
Holz, Helmut: *See—*
Malzkorn, Matthias; and Holz, Helmut, 4,610,583, Cl. 409-211.000.
Malzkorn, Matthias; and Holz, Helmut, 4,610,584, Cl. 409-211.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Furukawa, Yoshimi; and Sano, Shoichi, 4,610,455, Cl. 280-91.000.
Miyazawa, Takeshi; Sueshige, Hiroshi; Niikawa, Yutaka; and Shimokawa, Masahide, 4,610,335, Cl. 192-3.620.
Saito, Hiroshi; Nebu, Hideaki; Sakamoto, Tsuneaki; and Tanino, Tomoyasu, 4,610,230, Cl. 123-360.000.
Honeywell Inc.: *See—*
Nussbaum, Samuel E., 4,611,165, Cl. 324-77.00B.
Roberts, Jon A.; and Hendrickson, Thomas E., 4,610,062, Cl. 29-25.410.
Honeywell Information Systems Inc.: *See—*
Boothroyd, Donald C.; Wilhite, John E.; and Norman, Robert W., Jr., 4,611,278, Cl. 364-200.000.
Honjo, Yoshihiko; Yamada, Hisayoshi; Hosono, Kazuhiro; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium and reproducing apparatus therefor. 4,611,248, Cl. 358-342.000.
Hood, Leroy E.; Hunkapiller, Michael W.; Dreyer, William J.; Hewick, Rodney M.; and Stark, Anton W., to California Institute of Technology. Conversion flask for sequential performance apparatus. 4,610,847, Cl. 422-102.000.
Hoover, Alan A.; Luz, David W.; and Lendaro, Jeffery B., to RCA Corporation. Deflection rate parabolic waveform generating circuit. 4,611,151, Cl. 315-368.000.
Hoover, C. G., to S.I.E., Inc. Spring-biased heat sink. 4,610,299, Cl. 165-80.200.
Hoover, Gary M.: *See—*
O'Brien, John T.; Goff, Donald D.; and Hoover, Gary M., 4,610,309, Cl. 166-382.000.
Hori, Ryoichi; and Ito, Kiyoo, to Hitachi, Ltd. Monolithic storage device. 4,611,299, Cl. 365-189.000.
Horimatsu, Kazuo, to Tekken Construction Co., Ltd. Method of building strengthened embankment body. 4,610,572, Cl. 405-258.000.
Hoshino, Hirohisa: *See—*
Suko, Shouichi; and Hoshino, Hirohisa, 4,611,281, Cl. 364-200.000.
Hoshizaki Electric Co., Ltd.: *See—*
Kawasumi, Masaaki, 4,610,147, Cl. 62-137.000.
Hosking, Raymond E. Trench compaction device. 4,610,567, Cl. 404-121.000.
Hosoda, Seiichi: *See—*
Hattori, Shinichiro; Hosoda, Seiichi; Kanno, Masahide; and Amano, Atsushi, 4,611,271, Cl. 364-184.000.
Hosono, Kazuhiro: *See—*
Honjo, Yoshihiko; Yamada, Hisayoshi; Hosono, Kazuhiro; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,611,248, Cl. 358-342.000.
Hostetler, Glenn, to S.M.S. Industries, Inc. Mounting and display card for handle-operated tool. 4,610,354, Cl. 206-349.000.
Hou, Hsieh S., to Xerox Corporation. Halftone image scaling. 4,611,349, Cl. 382-47.000.
Houley, Daniel; and Baudoin, Patrice, to Regie Nationale des Usines Renault. Power transmission device for starting in forward or reverse. 4,610,181, Cl. 74-792.000.
Howald, Ernst: *See—*
Meyer, Gabriel; and Howald, Ernst, 4,610,669, Cl. 604-218.000.
Howell, John N. Pool table. 4,610,450, Cl. 273-3.00A.
Howey, Jon A.; and Rogers, Randall J., to Kendall Company, The. Nonwoven fabric. 4,610,352, Cl. 206-313.000.
Hudson, Paul. Control of algae in re-circulating water systems. 4,610,783, Cl. 210-169.000.
Hueil, J. Charles: *See—*
Rothfuss, Robert G.; Bilotti, Federico; Chow, Hector; Hueil, J. Charles; and Sambi, Narinderjit S., 4,610,383, Cl. 227-19.000.
Hugentobler, Stephane: *See—*
Gold-Aubert, Philippe; Melkonian, Diran; Vachta, Jindrich; Valter, Karel; Siegfried, Bernard; and Hugentobler, Stephane, 4,611,057, Cl. 544-301.000.
Hughes Aircraft Company: *See—*
Minahan, Joseph A.; Ralph, Eugene L.; and Dill, Hans G., 4,610,077, Cl. 29-572.000.
Hughes, Thomas R., to Chevron Research Company. Sulphur decontamination of conduits and vessels communicating with hydrocarbon conversion catalyst reactor during in situ catalyst regeneration. 4,610,972, Cl. 502-52.000.
Hughes Tool Company: *See—*
Bacon, William H.; and O'Toole, Francis S., 4,610,737, Cl. 156-49.000.
Reese, Dyke W.; Pace, Ray S.; and McKenzie, Lee F., 4,610,306, Cl. 166-293.000.
Huinink, Heinrich; Seitz, Hans; Rach, Heinz-Dieter; and Frerichs, Udo, to Continental Gummi-Werke Aktiengesellschaft. Apparatus for mounting pneumatic vehicle tires. 4,610,288, Cl. 157-1.220.
Human Industry Corporation: *See—*
Kumasaka, Sadao; Tada, Satomi; Katsuki, Koretoshi; Nagamine, Ryoji; and Taniguchi, Hiroshi, 4,610,922, Cl. 428-304.400.
Hummel, Werner: *See—*
Hauser, Kurt; and Hummel, Werner, 4,610,341, Cl. 192-58.00B.

Hunkapiller, Michael W.: *See—*
Hood, Leroy E.; Hunkapiller, Michael W.; Dreyer, William J.; Hewick, Rodney M.; and Stark, Anton W., 4,610,847, Cl. 422-102.000.

Hunt, Arlon J.: *See—*
Tewari, Param H.; and Hunt, Arlon J., 4,610,863, Cl. 423-338.000.

Husbands, G. E. Morris; Yardley, John P.; and Muth, Eric A., to American Home Products Corporation. Substituted phenylacetonitriles. 4,611,078, Cl. 558-410.000.

Hutson, Jack E.: *See—*
Ball, Ervin M.; and Hutson, Jack E., 4,611,150, Cl. 315-307.000.

Hy-Con Products, Inc.: *See—*
Young, William I., 4,610,353, Cl. 206-328.000.

Hydril Company: *See—*
Baron, Burwell E.; Kirsch, Gary E.; and Mott, Keith C., 4,610,834, Cl. 264-249.000.

Hyman, Roger L. Eyeglass assembly. 4,610,519, Cl. 351-86.000.

Ibaraki, Yoshiro: *See—*
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.

Ibrahim, Ibrahim H.; and Daly, Christopher N., to Telectronics N.V. Electronic sensor for static magnetic field. 4,611,127, Cl. 307-116.000.

Ichida, Nobuyuki: *See—*
Shimura, Takaki; Murakami, Keiichi; Miwa, Hirohide; Sato, Takuso; and Ichida, Nobuyuki, 4,610,255, Cl. 128-660.000.

Ichida, Takeshige: *See—*
Fujito, Katsuyuki; Nakata, Hiroaki; and Ichida, Takeshige, 4,611,352, Cl. 455-609.000.

Ichihashi, Hiroo: *See—*
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,610,202, Cl. 101-364.000.

Ichijo, Kohji: *See—*
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,610,214, Cl. 114-144.00E.

ICI Americas Inc.: *See—*
Lynch, Matthew J., 4,610,871, Cl. 424-48.000.
Lynch, Matthew J., 4,610,872, Cl. 424-49.000.

Ide, Fumito, to Kabushiki Kaisha Toshiba. Sheet material transporting apparatus. 4,610,446, Cl. 271-291.000.

Igarashi, Yuriko; and Takahashi, Masaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Microcapsules containing a hydrophobic, volatile core substance and their production. 4,610,927, Cl. 428-402.210.

Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Natsuyama, Yukihiro, to Nippon Soken, Inc. Piezoelectric control valve for fuel injector of internal combustion engine. 4,610,427, Cl. 251-129.060.

Igata, Kouichi; and Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. Video tape recorder. 4,611,252, Cl. 360-10.300.

Ihrman, Kryn G., to Ethyl Corporation. Monoalkylation of 1-alkyldiaminobenzenes. 4,611,045, Cl. 528-76.000.

Iida, Toshiharu: *See—*
Kamei, Kazuo; and Iida, Toshiharu, 4,611,253, Cl. 360-66.000.

Iijima, Masao: *See—*
Miyamoto, Yosuke; Goto, Hajime; Sato, Hiroshi; Okano, Hiroshi; and Iijima, Masao, 4,610,891, Cl. 427-3.000.

Iizuka, Haruhiko: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,611,199, Cl. 340-576.000.

Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, to Victor Company of Japan Ltd. Thermal transfer color gradation printing apparatus. 4,611,217, Cl. 346-76.0PH.

Ijichi, Kiyoteru: *See—*
Ohta, Yoshio; Kimura, Tadashi; Ijichi, Kiyoteru; and Takizawa, Masaaki, 4,610,421, Cl. 248-550.000.

Ikeda, Keiichiro, to Chevron Research Company. Method of seismic collection utilizing multicomponent receivers. 4,611,312, Cl. 367-38.000.

Ikeda, Masami: *See—*
Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, 4,611,219, Cl. 346-140.00R.

Ikeda, Toru: *See—*
Yukawa, Toshihide; Ikeda, Toru; Kishimoto, Shinichi; and Sugiyama, Katsumi, 4,610,827, Cl. 260-501.110.

Ikeda, Yoshiaki: *See—*
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,316, Cl. 369-44.000.
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,317, Cl. 369-45.000.

Ikehata, Tsutomu: *See—*
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Illinois Tool Works Inc.: *See—*
Ollivier, Jean; and Almeras, Roland, 4,610,382, Cl. 227-9.000.

Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, to Olympus Optical Co., Ltd. Solid state image pick-up device. 4,611,221, Cl. 357-30.000.

Imaizumi, Haruo: *See—*
Kobayashi, Satoru; Sato, Yoshiaki; and Imaizumi, Haruo, 4,610,552, Cl. 374-160.000.

Imamura, Kazunori: *See—*
Tanimoto, Akikazu; and Imamura, Kazunori, 4,610,541, Cl. 356-237.000.

Imanishi, Yuichiro; and Matsui, Minoru, to NGK Insulators, Ltd. Zirconia porcelain and method of manufacturing the same. 4,610,967, Cl. 501-103.000.

Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, to Hitachi, Ltd.; and Mitsubishi Chemical Industries. Anthraquinone dyes and liquid crystal compositions including the same. 4,610,804, Cl. 252-299.100.

Imperial Chemical Industries PLC: *See—*
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,611,062, Cl. 548-309.000.

Inagaki, Yoshio: *See—*
Torigoe, Masaaki; Inagaki, Yoshio; and Shishido, Tadao, 4,610,954, Cl. 430-445.000.

Inco Limited: *See—*
Babjak, Juraj, 4,610,861, Cl. 423-157.000.
England, John R.; and Desjardins, Donald A., 4,610,317, Cl. 175-331.000.

Independent Broadcasting Authority: *See—*
Brockhurst, David M.; Vivian, Roy H.; Dyer, Martyn R.; and Day, Stephen, 4,611,227, Cl. 358-147.000.

Indou, Masahiro: *See—*
Kikutani, Fumitaka; Furumai, Koro; Indou, Masahiro; and Fujishita, Kazuo, 4,610,626, Cl. 431-351.000.

Industrial Air, Inc.: *See—*
Bleier, Frank P., 4,610,600, Cl. 416-207.000.

Industrial Innovations, Inc.: *See—*
Ray, Jimmy C.; and Mathews, H. Wayne, 4,611,099, Cl. 179-175.000.

Industriell Arbetshygien i Soderhamn AB: *See—*
Krantz, Anders, 4,610,702, Cl. 55-155.000.

Ingman, Matti: *See—*
Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, 4,610,761, Cl. 162-157.600.

Ingram, Gary D.: *See—*
Mullins, Albert A., II; Stone, Patrick C.; and Ingram, Gary D., 4,610,300, Cl. 166-134.000.

Inoko, Kenji, to Tetra Pak International Aktiebolag. Dividing device for collecting commodities incorporated in a commodity collecting device. 4,610,347, Cl. 198-425.000.

Inoue, Akira, to Olympus Optical Company, Ltd. Power supply unit for electronic flash. 4,610,521, Cl. 354-145.100.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,611,107, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Precision TW electroerosion with superimposed multiple opening guides. 4,611,107, Cl. 219-69.00W.

Institut Kosmicheskish Issledovany Akademi Nauk SSS: *See—*
Managadze, Georgy G., 4,611,118, Cl. 250-287.000.

Institut National de Recherche Chimique Appliquee: *See—*
Galzy, Pierre; Moulin, Guy; Dick, Richard; and Mavel, Gerard, 4,610,887, Cl. 426-490.000.

Institut Textile de France: *See—*
Voisin, Eugene, 4,610,379, Cl. 226-42.000.

Institute po Mechanika I Biomechanika: *See—*
Georgiev, Vesselin Y.; and Mednikarov, Vladimir S., 4,610,264, Cl. 137-119.000.

Insul Company, Inc.: *See—*
LaBate, Michael D., II; and Perri, Joseph A., 4,610,436, Cl. 266-272.000.

Intelledex Incorporated: *See—*
Wright, Allen J., 4,610,597, Cl. 414-729.000.

Inter Metals and Minerals, S.A.: *See—*
Law, Malcolm J., 4,610,763, Cl. 204-35.100.

International Business Machines Corporation: *See—*
Andresen, Mark E.; Kriz, Thomas A.; and Potemski, Andrew S., 4,611,279, Cl. 364-200.000.
Bednar, Gregory M.; Fryer, George B.; and Narasimha, Manthri S., 4,611,346, Cl. 382-9.000.
Crehan, Donald T.; and Lovell, Charles J., 4,611,306, Cl. 364-900.000.
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,611,203, Cl. 340-773.000.
Lomet, David B., 4,611,272, Cl. 364-200.000.
Pione, Anthony E., 4,611,273, Cl. 364-200.000.

International Flavors & Fragrances Inc.: *See—*
Hall, John B., 4,610,812, Cl. 252-522.00R.

Intraub, Julius, to Technicon Instruments Corporation. Apparatus and method for self-resonant vibrational mixing. 4,610,546, Cl. 366-110.000.

Inuzuka, Sinobu: *See—*
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, 4,610,296, Cl. 164-469.000.

Iolab Corporation: *See—*
Beard, Charles D.; Doddi, Namassivaya; and Yamada, Akira, 4,611,061, Cl. 548-260.000.

Ionescu, Dragos; and Soiman, Mihai, to Wedtech Corp. Ignition circuit, especially for magneto-triggered internal combustion engines. 4,610,237, Cl. 123-600.000.

Ipsen Industries International GmbH: *See—*
Pfau, Hans; and Fleiter, Albert, 4,610,435, Cl. 266-250.000.

Ireland, Thomas R., to Hallmark Findings, Inc. Earring support. 4,610,149, Cl. 63-12.000.

Irie, Taisuke: *See—*
Ito, Takehiko; Irie, Taisuke; Nakagawa, Yoshitaka; and Watanabe, Koichi, 4,610,937, Cl. 428-659.000.

Ise, Masahiro: *See—*
Machino, Katsuyuki; Ise, Masahiro; and Tanaka, Hidehiko, 4,611,274, Cl. 364-200.000.

Ishida, Masamitsu; Asai, Eiichi; and Higashi, Nobuaki, to Fuji Photo Film Company, Limited. Radiation image reproducing apparatus. 4,611,247, Cl. 358-280.000.

Ishida, Shoji, to Takao Ooi wa. Switch device for angularly adjusting outer rear mirrors of an automotive vehicle. 4,611,102, Cl. 200-5.00R.

Ishiguro, Minoru: *See*—
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, 4,610,522, Cl. 354-173.100.

Ishihara, Naoki; and Kuen, Choy K. Hand held vacuum cleaner. 4,610,048, Cl. 15-344.000.

Ishihara, Tsutomu, to NEC Corporation. Signal conversion circuit. 4,611,129, Cl. 307-308.000.

Ishii, Masaji: *See*—
Yamada, Mitsunori; Ishii, Masaji; Miyai, Akira; Nakajima, Yukihiko; and Sato, Shinsei, 4,610,858, Cl. 423-342.000.

Ishii, Masami: *See*—
Niwa, Shigeo; Sugishita, Junji; and Ishii, Masami, 4,610,693, Cl. 623-16.000.

Ishikawa, Chuji; and Araki, Shigeyuki, to Ricoh Company, Ltd. Charged ink particles detection housing. 4,611,216, Cl. 346-75.000.

Ishikawa, Fumiyoshi, to Daiichi Seiyaku Co., Ltd. Imidazoquinazolin-2-one compounds. 4,610,987, Cl. 514-239.000.

Ishikawa, Shozo: *See*—
Takiguchi, Takao; Miyazaki, Hajime; Matsumoto, Masakazu; and Ishikawa, Shozo, 4,610,943, Cl. 430-76.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Koga, Minoru; Kizawa, Toshio; and Hirose, Toshio, 4,610,315, Cl. 175-85.000.

Ishikura, Hidenobu: *See*—
Hine, Shiro; and Ishikura, Hidenobu, 4,611,223, Cl. 357-30.000.

Ishizumi, Kikuo; Muramatsu, Michihisa; Tanno, Norihiko; Sato, Hiromi; and Yoshida, Noboru, to Sumitomo Chemical Company, Limited. Aminonaphthacene derivatives and their production. 4,610,986, Cl. 514-239.000.

Isobe, Takehiro; and Hashimoto, Tatsuji, to Nippon Soda Co., Ltd. Hot-dip zinc alloy coated steel products. 4,610,936, Cl. 428-659.000.

Israel, Mervyn; and Seshadri, Ramakrishnan, to University of Tennessee Research Corporation, The. N-alkyl and N-benzyl adriamycin derivatives. 4,610,977, Cl. 514-34.000.

Italtel Tecnomeccanica S.p.A.: *See*—
Cecchellero, Sergio; and Salvatore, Daniele, 4,610,561, Cl. 403-171.000.

Ito, Fukusaburo; Kataoka, Hiroshi; and Itoh, Keizoh, to Sharp Kabushiki Kaisha. Cleaning device for copying machines. 4,610,534, Cl. 355-15.000.

Ito, Haruhiko: *See*—
Fujiyasu, Koichiro; Yoneyama, Shigeki; and Ito, Haruhiko, 4,610,802, Cl. 252-188.200.

Ito, Kiyoo: *See*—
Hori, Ryoichi; and Ito, Kiyoo, 4,611,299, Cl. 365-189.000.

Ito, Takehiko; Irie, Taisuke; Nakagawa, Yoshitaka; and Watanabe, Koichi, to Nisshin Steel Company. Product of and process for preparing Zn-Ni-alloy-electroplated steel sheets excellent in corrosion resistance. 4,610,937, Cl. 428-659.000.

Ito, Toshiharu: *See*—
Sobue, Hideo; and Ito, Toshiharu, 4,610,164, Cl. 73-290.00V.

Itoh, Keizoh: *See*—
Ito, Fukusaburo; Kataoka, Hiroshi; and Itoh, Keizoh, 4,610,534, Cl. 355-15.000.

Itoh, Masayoshi: *See*—
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, 4,610,859, Cl. 423-347.000.

ITT Corporation: *See*—
Lee, William C., 4,611,212, Cl. 343-351.000.

Iwahashi, Hiroshi; Asano, Masamichi; and Minagawa, Hidenobu, to Kabushiki Kaisha Toshiba. Read only memory. 4,611,301, Cl. 365-207.000.

Iwamori, Hidekazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash-plate-type compressor with a muffling arrangement. 4,610,604, Cl. 417-269.000.

Iwamoto, Hidenori: *See*—
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,610,821, Cl. 540-200.000.

Iwao, Noriaki; and Katsumata, Fuyuki, to Tomy Kogyo Co. Inc. Infant activity toy. 4,610,638, Cl. 446-241.000.

Iwase, Seiichiro, to Sony Corporation. Digital signal processing circuit. 4,611,305, Cl. 364-736.000.

Iwashita, Masahiro: *See*—
Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, 4,610,127, Cl. 56-14.600.

Iwata, Kenji: *See*—
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, 4,610,859, Cl. 423-347.000.

Iwata, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 4,610,232, Cl. 123-425.000.

Iwatsu Electric Co., Ltd.: *See*—
Suko, Shouichi; and Hoshino, Hirohisa, 4,611,281, Cl. 364-200.000.

Iwatsuki, Masahiro: *See*—
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, 4,610,480, Cl. 297-478.000.

J. M. Voith GmbH: *See*—
Kotitschke, Gerhard; and Benz, Wilheim, 4,610,097, Cl. 34-117.000.

Jaatinen, Jari, to Oy Fiskars Ab Veneveistamo. Lifeboat release hook. 4,610,474, Cl. 294-82.270.

Jacobson, Roger K.; and Munson, Ronald W., to Bemis Company, Inc. Method of and apparatus for manufacturing bags with tabs. 4,610,651, Cl. 493-212.000.

Jacoby, John E.; Yu, Ho; and Ramser, Robert A., to Aluminum Company of America. Direct chill casting of aluminum-lithium alloys. 4,610,295, Cl. 164-5.000.

Jagenberg AG: *See*—
Voss, Peter; and Osburg, Dieter, 4,610,593, Cl. 414-43.000.

Jain, Nemichand B.; Gertie, Linda P.; and Rudnic, Edward M., to E. R. Squibb & Sons, Inc. Controlled release formulation. 4,610,870, Cl. 424-19.000.

Jalimar Industries Inc.: *See*—
Sherbondy, William A., 4,610,373, Cl. 221-155.000.

James River-Norwalk, Inc.: *See*—
Salmeen, Nilo I., deceased; and Klowak, Bernard G., 4,610,743, Cl. 156-183.000.

Janome Sewing Machine Co., Ltd.: *See*—
Makabe, Hachiro; Tanaka, Haruhiko; and Kongoh, Takeshi, 4,610,211, Cl. 112-445.000.

Jarman, Davis R.; and Hinson, Virgil H., to Grabber Manufacturing Company. Unibody gauge support. 4,610,093, Cl. 33-180.0AT.

Jatko, W. Bruce; McNeilly, David R.; and Thacker, Louis H., to United States of America, Energy. Precision linear ramp function generator. 4,611,176, Cl. 328-184.000.

Jensen, James W., to Adolph Coors Company. Method and device for providing longitudinal and lateral stretch control in laminated webs. 4,610,739, Cl. 156-64.000.

Jensen, Marvin E.: *See*—
Schneider, Barry L.; Jensen, Marvin E.; and Mohiuddin, Mahmood, 4,610,676, Cl. 604-339.000.

Jervis, James E., to Raychem Corporation. Encapsulating a splice with a gel-filled case. 4,610,738, Cl. 156-49.000.

Jeschke, Willi, to Heidelberger Druckmaschinen AG. Printing unit with short inking device. 4,610,201, Cl. 101-217.000.

Jester, Willi: *See*—
Fellmeth, Gunther; and Jester, Willi, 4,610,585, Cl. 409-233.000.

Jeumont-Schneider: *See*—
Garnier, Jean-Francois, 4,611,275, Cl. 364-200.000.

Jha, Mahesh C.: *See*—
Duyvesteyn, Willem P. C.; and Jha, Mahesh C., 4,610,721, Cl. 75-97.00A.

Jinriki, Tatenori: *See*—
Hamada, Toyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; Jinriki, Tatenori; and Koizumi, Kiyohide, 4,610,598, Cl. 411-744.00A.

Joerger, Richard B.: *See*—
Miller, William J.; Chiu, Ran F.; Joerger, Richard B.; and Newdeck, Frank W., 4,611,342, Cl. 381-36.000.

Johannesburg Construction Corporation (Proprietary Limited). *See*—
Bock, Immo E., 4,610,203, Cl. 102-217.000.

Johannesson, Leif B., to Alfa-Laval Agri International AB. Metering apparatus. 4,610,163, Cl. 73-250.000.

Johns Hopkins University, The: *See*—
Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., 4,610,249, Cl. 128-328.000.

Johnson, Douglas R.; and Ribeiro, Nana. Packaging for paper. 4,610,350, Cl. 206-216.000.

Johnson, Erlon F.; and Richards, Craig D., to AMP Incorporated. Coaxial connector for antenna. 4,611,213, Cl. 343-702.000.

Johnson & Johnson G.m.b.H.: *See*—
Friese, Axel, 4,610,659, Cl. 604-11.000.

Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., to Nabisco Brands, Inc. Adsorption-desorption purification of glucose isomerase. 4,610,965, Cl. 435-234.000.

Johnson, Sam E. Shoulder protection device. 4,610,034, Cl. 2-2.000.

Johnson, Steven W.; and Olsen, Alden W., to Atlantic Richfield Company. Apparatus for intimately contacting particulate solids with a heavy liquid. 4,610,218, Cl. 118-303.000.

Joll, David J.: *See*—
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,610,844, Cl. 426-641.000.

Jomes, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, to Lever Brothers Company. Porous polymers. 4,611,014, Cl. 521-146.000.

Jones, Leo V., Jr.; and Walsh, A. Lee, to GTE Communication Systems Corporation. DTMF receiver sense and control arrangement. 4,611,325, Cl. 370-110.300.

Jungkind, Roland, to Metallwerk K. Pittl Ges.mbH & Co. KG. Ski binding. 4,610,459, Cl. 280-615.000.

Junkosha Company Ltd.: *See*—
Kobayashi, Satoru; Sato, Yoshiaki; and Imaizumi, Haruo, 4,610,552, Cl. 374-160.000.

Jurgens, Rainer; and Kruger, Volker, to Norton Company. Method and apparatus for selectively straight or directional drilling in subsurface rock formation. 4,610,307, Cl. 175-320.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Sugioka, Yukio; and Mikami, Yoshiharu, 4,610,322, Cl. 177-25.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, 4,610,480, Cl. 297-478.000.

Kabushiki Kaisha Toshiba: *See*—
Ide, Fumito, 4,610,446, Cl. 271-291.000.

Iwahashi, Hiroshi; Asano, Masamichi; and Minagawa, Hidenobu, 4,611,301, Cl. 365-207.000.
Matsukawa, Naohiro; and Nozawa, Hiroshi, 4,610,078, Cl. 29-576.00B.
Minami, Hiroshi, 4,611,144, Cl. 313-373.000.
Okazaki, Kiyoshi, 4,611,340, Cl. 378-95.000.
Watanabe, Junji, 4,611,218, Cl. 346-76.0PH.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Iwamori, Hidekazu, 4,610,604, Cl. 417-269.000.

Kaczerwaski, David J., to Mobil Oil Corporation. Bag having a band of reduced diameter. 4,611,350, Cl. 383-7.000.

Kadaba, Pankaja K., to University of Kentucky Research Foundation, The. 1,2,3-triazole anticonvulsant drugs. 4,610,994, Cl. 514-340.000.

Kahn, John H.: *See*—
Murib, Jawad H.; and Kahn, John H., 4,611,069, Cl. 549-326.000.

Kahn, William M.: *See*—
Peach, Roy W.; Kahn, William M.; and Shapiro, David, 4,611,307, Cl. 364-900.000.

Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, to Rauma-Repola Oy. Doped lignin polymer. 4,610,809, Cl. 252-500.000.

Kajitani, Taizo; Fujii, Shigeo; Sato, Tadao; Yonehara, Ikuo; Fukumura, Chikashi; and Harita, Kenji, to Chisso Corporation. Process for producing purified monoammonium phosphate from wet process phosphoric acid. 4,610,853, Cl. 423-310.000.

Kajitani, Taizo; Fujii, Shigeo; Sato, Tadao; Yonehara, Ikuo; Fukumura, Chikashi; and Harita, Kenji, to Chisso Corporation. Process for producing purified diammonium phosphate from wet process phosphoric acid. 4,610,862, Cl. 423-310.000.

Kaleskas, Edward W.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,610,276, Cl. 137-856.000.

Kalininsky Politekhnichesky Institut USSR: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Vikior I., 4,610,850, Cl. 422-131.000.

Kallai, Istvan: *See*—
Czeiler, Andras; Keri, Miklos; Balogh, Bela; Fejes, Erno ; Kallai, Istvan; and Lukacs, Sandor, 4,610,217, Cl. 118-47.000.

Kalsi, Manmohan S. Hydrodynamic lubricant seal for drill bits. 4,610,319, Cl. 175-371.000.

Kamamori, Hitoshi; Tsunoda, Yukiyoshi; Suginoya, Mitsuru; Sano, Yutaka; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Color liquid crystal display device having multicolor polarizers. 4,610,507, Cl. 350-335.000.

Kamano, Yoskiaki: *See*—
Pettit, George R.; Herald, Cherry L.; and Kamano, Yoskiaki, 4,611,066, Cl. 549-267.000.

Kamata, Shigeru, to Canon Kabushiki Kaisha. Mounting for zoom lens. 4,610,512, Cl. 350-429.000.

Kamata, Yoshio: *See*—
Miyamura, Masao; Tsukakoshi, Osamu; Kamata, Yoshio; and Aiba, Shoji, 4,611,121, Cl. 250-423.00R.

Kamei, Kazuo; and Iida, Toshiharu, to Pioneer Electronic Corporation. Magnetic recording and reproducing device. 4,611,253, Cl. 360-66.000.

Kamei, Tsuneaki: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.

Kameshita, Ryutaro, to Toyo Unpanki Co., Ltd. Speed changer for vehicles used in construction work. 4,610,178, Cl. 74-335.000.

Kaminski, Elton G.; and Hasselbeck, Richard J., to Stolle Corporation, The. Progressive die apparatus having resilient tool support means. 4,610,156, Cl. 72-431.000.

Kamiyama, Yukio: *See*—
Hishiki, Hideo; and Kamiyama, Yukio, 4,611,152, Cl. 315-411.000.

Kamuf, Jerry A.; and Arnold, Russell L., to Premium Allied Tool, Inc. Cathode ray tube cathode with cap and sleeve structure. 4,611,145, Cl. 313-446.000.

Kan, Masanori; and Fujiwara, Hideo, to Toyo Tire and Rubber Co., Ltd. Composition for pneumatic tires. 4,611,030, Cl. 525-99.000.

Kanada, Eiji; Endo, Kazunaka; Yamamoto, Kyonosuke; and Suzuki, Shigeyoshi, to Mitsubishi Paper Mills, Ltd. Method for direct plate making from multicolor original. 4,610,949, Cl. 430-301.000.

Kanamaru, Masatoshi: *See*—
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.

Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, to Mazda Motor Corp.; and Nippon Seiko Kabushiki Kaisha. Four-wheel steering system for vehicle. 4,610,328, Cl. 180-140.000.

Kane, James G.: *See*—
Pedicano, James J.; Kane, James G.; and Pedicano, Ernest, 4,610,667, Cl. 604-192.000.

Kane, Jerry A.; and Smith, Winthrop W., Jr., to United States of America, Air Force. Means for aligning elevation beam pattern along an isodop in synthetic aperture mapping radar. 4,611,208, Cl. 343-5.0CM.

Kaneko, Masaharu: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,610,804, Cl. 252-299.100.

Kaneko, Rokusaburo; and Takenaka, Yuji, to Fuji Photo Film Co, Ltd. Method for automatically selecting a lens. 4,610,539, Cl. 355-77.000.

Kaneko, Takatoshi: *See*—
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, 4,611,217, Cl. 346-76.0PH.

Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, to Diafoil Company, Limited. Process for preparing biaxially stretched polyester films. 4,610,833, Cl. 264-235.800.

Kanno, Masahide: *See*—
Hattori, Shinichiro; Hosoda, Seiichi; Kanno, Masahide; and Amano, Atsushi, 4,611,271, Cl. 364-184.000.

Kanto Yakin Kogyo Kabushiki Kaisha: *See*—
Takahashi, Susumu, 4,610,390, Cl. 228-207.000.

KAO Corporation: *See*—
Yamashita, Osamu; Moriyama, Noboru; Ootani, Shoji; and Wasamoto, Katsuyo, 4,611,087, Cl. 560-81.000.

Kapralov, Valery K.: *See*—
Kazak, Vadim N.; Kapralov, Valery K.; and Volk, Alfei F., deceased, 4,610,303, Cl. 166-251.000.

Kapur, Vijay K.: *See*—
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., 4,611,091, Cl. 136-260.000.

Kar, Kishore K., to Dow Chemical Company, The. Metallo-organo aluminates as lubricant additives. 4,610,797, Cl. 252-35.000.

Karkiewicz, Kenneth G., to Dougherty Brothers Company. Tamper evident dispensing closure assembly. 4,610,371, Cl. 220-266.000.

Karlan, Paul. Cam engine. 4,610,223, Cl. 123-58.0AM.

Kasahara, Osamu: *See*—
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.

Kashino, Shinzo: *See*—
Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, 4,610,127, Cl. 56-14.600.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Baby carriage. 4,610,460, Cl. 280-650.000.

Kataoka, Hiroshi: *See*—
Ito, Fukusaburo; Kataoka, Hiroshi; and Itoh, Keizoh, 4,610,534, Cl. 355-15.000.

Kataoka, Hiroyuki: *See*—
Yoshida, Masaaki; and Kataoka, Hiroyuki, 4,610,525, Cl. 354-415.000.

Katayama, Hiroyuki: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, 4,610,912, Cl. 428-213.000.

Kato, Masaaki: *See*—
Tokunaga, Toshihide; and Kato, Masaaki, 4,610,506, Cl. 350-96.330.

Kato, Masashi: *See*—
Takahashi, Tomoyuki; Kato, Masashi; and Kikuchi, Hisashi, 4,610,520, Cl. 354-86.000.

Kato, Masatoshi; and Kitaguchi, Hiroshi, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material. 4,610,957, Cl. 430-542.000.

Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, to Hitachi, Ltd. Low-pressure mercury vapor discharge lamp. 4,611,148, Cl. 313-595.000.

Katoh, Tadayuki: *See*—
Shirai, Akira; Takizawa, Kazushige; Nishikawa, Yasuhisa; and Katoh, Tadayuki, 4,610,946, Cl. 430-278.000.

Katsube, Hideo; and Aso, Toshiyuki;, to Fanuc Ltd. Automatic tool changer of a machine tool. 4,610,074, Cl. 29-568.000.

Katsuki, Koretoshi: *See*—
Kumasaka, Sadao; Tada, Satomi; Katsuki, Koretoshi; Nagamine, Ryoji; and Taniguchi, Hiroshi, 4,610,922, Cl. 428-304.400.

Katsumata, Fuyuki: *See*—
Iwao, Noriaki; and Katsumata, Fuyuki, 4,610,638, Cl. 446-241.000.

Katz, Howard G.: *See*—
Mudge, Paul R.; and Katz, Howard G., 4,610,920, Cl. 428-288.000.

Kaukanen, Esko: *See*—
Ekholm, Pertti; and Kaukanen, Esko, 4,610,170, Cl. 73-864.220.

Kawabata, Mikio: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.

Kawada, Masashi: *See*—
Watanabe, Kozo; and Kawada, Masashi, 4,610,124, Cl. 53-399.000.

Kawai, Taneichi, to Aisin Seiki Kabushiki Kaisha. Adjusting device for the optical axis of a headlamp beam. 4,611,263, Cl. 362-71.000.

Kawakami, Haruo: *See*—
Yamada, Masao; and Kawakami, Haruo, 4,610,841, Cl. 376-305.000.

Kawakubo, Shoji: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.

Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, to Hitachi, Ltd. Printed circuit board, process for preparing the same and resist ink used therefor. 4,610,910, Cl. 428-209.000.

Kawasumi, Masaaki, to Hoshizaki Electric Co., Ltd. Ice detector for an ice making machine. 4,610,147, Cl. 62-137.000.

Kawauchi, Hiroshi; and Kyoto, Michihisa, to Sumitomo Electric Industries, Ltd. Method for producing glass preform for optical fiber. 4,610,709, Cl. 65-3.120.

Kazak, Vadim N.; Kapralov, Valery K.; and Volk, Alfei F., deceased (by Volk, Igor F., administrator), to Vsesojuznoe Nauchno-Proizvod Stvennoe Obiedinenie "Sojuzpromgaz". Method of underground gasification of a series of gently dipping and inclined coal seams. 4,610,303, Cl. 166-251.000.

Keane, James, to Linnola Ltd. Removal of chlorine-based contaminants from materials contaminated with same. 4,610,729, Cl. 134-25.100.

Kearns, John J.: *See—*
Fountain, Michael W.; Weiss, Steven J.; Kearns, John J.; Weiner, Alan L.; and Popescu, Mircea C., 4,610,868, Cl. 424-1.100.

Keegan, Richard G.: *See—*
Hatch, Ronald R.; and Keegan, Richard G., 4,611,293, Cl. 364-571.000.

Keese, Frank M.: *See—*
Effenberger, John A.; Ribbans, Robert C., III; and Keese, Frank M., 4,610,918, Cl. 428-245.000.

Keiner, Heinz, to Ernst Leitz Wetzlar GmbH. Carrying strap mounting. 4,610,476, Cl. 294-149.000.

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Kelley, Don H.: *See—*
Meyer, Louis W.; McKinney, Linda M.; and Kelley, Don H., 4,611,044, Cl. 528-56.000.

Kelly, James E.: *See—*
Chen, Janglin; Kelly, James E.; and Plakunov, James, 4,610,955, Cl. 430-527.000.

Kelly, Joseph B.: *See—*
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Kelsey, John. Apparatus for grinding and/or reconditioning plane, annular surfaces. 4,610,112, Cl. 51-241.0VS.

Kemppainen, John C.; and Trelford, Thomas E., to BankAmerica Corporation. Microcomputer communications software. 4,611,277, Cl. 364-200.000.

Kendall Company, The: *See—*
Howey, Jon A.; and Rogers, Randall J., 4,610,352, Cl. 206-313.000.
Rosenberg, Helmut W. G., 4,610,660, Cl. 604-49.000.
Rosenberg, Helmut W. G., 4,610,663, Cl. 604-99.000.

Kenjyo, Hideyuki: *See—*
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,316, Cl. 369-44.000.
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Kennametal Inc.: *See—*
Nemeth, Bela J.; and Grab, George P., 4,610,931, Cl. 428-547.000.

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Boecker, Wolfgang D. G.; and Hailey, Laurence N., 4,610,934, Cl. 428-627.000.

Kent, James, to Fiber Bond Corporation. Binder for fibrous padding. 4,610,919, Cl. 428-285.000.

Kent Subsidiary of Kidde Inc.: *See—*
Dibert, Grant, Jr.; and Shelton, David, 4,610,489, Cl. 312-227.000.

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Kern, Alfred, to Aurora Konrad G. Schulz GmbH & Co. Air supply nozzle. 4,610,196, Cl. 98-2.000.

Keys, Francis J. Golf tee. 4,610,451, Cl. 273-33.000.

Khoe, Giok D.; and Nicia, Antonius J. A., to U.S. Philips Corporation. Method of manufacturing a grating. 4,610,757, Cl. 156-655.000.

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Kiba, Yasuo: *See—*
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.

Kiersarsky, Albert S.; Sauer, Earl S.; Vesperman, William C.; and Wilson, Max K., to AT&T Technologies, Inc. Plastic-coated metallic member. 4,610,909, Cl. 428-202.000.

Kikuchi, Haruhiko, to Nisshin Flour Milling Co., Ltd.; and Nisshin Chemicals Co., Ltd. Process for preparing L-carnitine and salts thereof. 4,610,828, Cl. 260-501.130.

Kikuchi, Hisashi: *See—*
Takahashi, Tomoyuki; Kato, Masashi; and Kikuchi, Hisashi, 4,610,520, Cl. 354-86.000.

Kikutani, Fumitaka; Furumai, Koro; Indou, Masahiro; and Fujishita, Kazuo, to Matsushita Electric Industrial Co., Ltd. High load gas combustion apparatus. 4,610,626, Cl. 431-351.000.

Kilinskis, David C.: *See—*
Campisi, Carl; Kilinskis, David C.; Skerlos, Peter C.; and Sorlie, Egil, 4,610,083, Cl. 29-832.000.

Kils el Ab: *See—*
Lersten, Bjarne; and Svensson, Kjell, 4,610,208, Cl. 110-244.000.

Kilsdonk, Jan A.: *See—*
Schwartz, Lawrence; Kilsdonk, Jan A.; and Steele, Jerry T., 4,610,496, Cl. 339-91.00B.

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Raley, John M., 4,610,685, Cl. 604-366.000.
Sallee, Lorry F.; and Thorson, Russell E., 4,610,745, Cl. 156-244.110.
Strohbeen, David T.; and VanDeurzen, John I., 4,610,681, Cl. 604-396.000.

Kimble, James B.: *See—*
Kolts, John H.; Figard, Joseph E.; Kimble, James B.; and Kubicek, Donald H., 4,610,766, Cl. 204-157.520.

Kimura, Gen. Cord for retaining a surfboard. 4,610,634, Cl. 441-75.000.

Kimura, Tadashi: *See—*
Ohta, Yoshio; Kimura, Tadashi; Ijichi, Kiyoteru; and Takizawa, Masaaki, 4,610,421, Cl. 248-550.000.

Kinami, Kenichi: *See—*
Yamamoto, Toshiaki; and Kinami, Kenichi, 4,611,055, Cl. 536-119.000.

Kinanen, Anita: *See—*
Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, 4,610,809, Cl. 252-500.000.

Kinashi, Hiroshi; and Takahashi, Kozo, to Sharp Kabushiki Kaisha. Electrophotographic copying machine with delayed development bias voltage application. 4,610,528, Cl. 355-3.0DD.

Kindig, Alan L.; and Peters, Fredus N., III, to General Electric Company. Hermetic compressor unit. 4,611,138, Cl. 310-71.000.

King, Dennis D.; and Dautel, David F., to E-Systems, Inc. Method and apparatus for generating a timing signal in a time-of-arrival detection system. 4,610,549, Cl. 368-113.000.

King, Gary N.: *See—*
Goekler, Robert G.; and King, Gary N., 4,610,403, Cl. 242-7.230.

King, Harry L., to Eltech Systems Corporation. Dense cermets containing fine grained ceramics and their manufacture. 4,610,726, Cl. 75-233.000.

Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, to Tokyo Juki Industrial Co., Ltd. Sewing machine. 4,610,210, Cl. 112-121.120.

Kinzler, Hans: *See—*
Dirmeyer, Josef; Kinzler, Hans; Lahner, Karlheinz; and Schulz, Hans-Werner, 4,611,185, Cl. 333-167.000.

Kirchweger, Karl; Knopf, Franz; and Thien, Gerhard, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH, Prof.Dr.Dr.h.c. Hans List. Air cooling arrangement for encapsulated vehicle engine. 4,610,326, Cl. 180-68.100.

Kirhofer, Walter J.: *See—*
Molander, Lance E.; Tiegelmann, Gabriel; and Kirhofer, Walter J., 4,610,492, Cl. 312-305.000.

Kirkpatrick, Paul A.; Schulman, Marvin; Lehmann, Douglas M.; and Hegadorn, Joseph L., to General Foods Corporation. Three-fluid atomizing nozzle and method of utilization thereof. 4,610,760, Cl. 159-4.010.

Kirsch, Gary E.: *See—*
Baron, Burwell E.; Kirsch, Gary E.; and Mott, Keith C., 4,610,834, Cl. 264-249.000.

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Yukawa, Toshihide; Ikeda, Toru; Kishimoto, Shinichi; and Sugiyama, Katsumi, 4,610,827, Cl. 260-501.110.

Kiskunhalasi Allami Gazdasag: *See—*
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Kitaguchi, Hiroshi: *See—*
Kato, Masatoshi; and Kitaguchi, Hiroshi, 4,610,957, Cl. 430-542.000.

Kitamoto, Tatsuji: *See—*
Nomura, Masaaki; Nahara, Akira; and Kitamoto, Tatsuji, 4,610,903, Cl. 428-64.000.

Kitano, Kouichi, to Fujitsu Limited. Word-line discharging circuit in a static-type semiconductor memory device. 4,611,303, Cl. 365-230.000.

Kitson, Melanie, to British Petroleum Company p.l.c., The. Vapour phase hydrogenation of esters. 4,611,085, Cl. 568-885.000.

Kizawa, Toshio: *See—*
Koga, Minoru; Kizawa, Toshio; and Hirose, Toshio, 4,610,315, Cl. 175-85.000.

Klages, Claus P., to U.S. Philips Corporation. Etching solution for and method of etching ferrimagnetic garnet compounds. 4,610,759, Cl. 156-662.000.

Klauke, Erich: *See—*
Marhold, Albrecht; Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Becker, Benedikt; Krehan, Ingomar; and Stendel, Wilhelm, 4,611,003, Cl. 514-452.000.

Klauminzer, Gary K.; Merz, S. Spencer; and Campbell, James D., to Questek Incorporated. Method and means of controlling the output of a pulsed laser. 4,611,270, Cl. 364-183.000.

Klein, Joseph T.: *See—*
Davis, Larry; and Klein, Joseph T., 4,610,988, Cl. 514-253.000.

Kleiner, Lothar W., to Mitech Corporation. Conductive resinous composites. 4,610,808, Cl. 252-512.000.

Kliethermes, Andrew J.: *See—*
Damon, Billy L.; and Kliethermes, Andrew J., 4,610,278, Cl. 140-92.100.

Klos, Karl: *See*—
Kommoss, Klaus; Klos, Karl; Dietz, Hans W.; and Koppeler, Thomas H. W., 4,611,254, Cl. 360-69.000.
Klose, Hans-Ulrich: *See*—
Rach, Heinz-Dieter; Frerichs, Udo; Klose, Hans-Ulrich; and Boltze, Carsten, 4,610,287, Cl. 157-1.170.
Klowak, Bernard G.: *See*—
Salmeen, Nilo I., deceased; and Klowak, Bernard G., 4,610,743, Cl. 156-183.000.
Knapp, Alfons, to Gevipi A.G. Mixer valve with hard material plaques, having a movable cartridge loaded by the water pressure. 4,610,268, Cl. 137-454.600.
Knauer, Robert C., Jr.: *See*—
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,611,170, Cl. 324-229.000.
Knecht, William R.: *See*—
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,611,203, Cl. 340-773.000.
Knopf, Franz: *See*—
Kirchweger, Karl; Knopf, Franz; and Thien, Gerhard, 4,610,326, Cl. 180-68.100.
Knowles, Steven M.: *See*—
Geer, Linda L.; and Knowles, Steven M., 4,610,466, Cl. 285-12.000.
Knox, Howard T., to Ancra Corporation. Buckle tiedown assembly. 4,610,055, Cl. 24-68.0CD.
Knox, Kenneth H.; and Larkin, Mark E., to Abbott Laboratories. Flexible container and mixing system for storing and preparing I.V. fluids. 4,610,684, Cl. 604-416.000.
Knud Simonsen Industries Limited: *See*—
Buller-Colthurst, Guy E., 4,610,886, Cl. 426-233.000.
Kobayashi, Hiroshi; and Obayashi, Hiroaki, to Nissan Motor Company, Limited. Fuel volume measuring system for automotive vehicle. 4,611,287, Cl. 364-442.000.
Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. Signal processing apparatus for a video signal. 4,611,231, Cl. 358-160.000.
Kobayashi, Masaaki: *See*—
Igata, Kouichi; and Kobayashi, Masaaki, 4,611,252, Cl. 360-10.300.
Kobayashi, Masaharu: *See*—
Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, 4,611,335, Cl. 375-110.000.
Kobayashi, Norio: *See*—
Sekiguchi, Hisashi; Kobayashi, Norio; and Ohgishi, Hideo, 4,611,036, Cl. 525-481.000.
Kobayashi, Sadao: *See*—
Yamamoto, Takakazu; Yamamoto, Sadaaki; Kobayashi, Sadao; and Sukawa, Hiroshi, 4,610,811, Cl. 252-511.000.
Kobayashi, Satoru; Sato, Yoshiaki; and Imaizumi, Haruo, to Junkosha Company Ltd. Temperature sensor for cables. 4,610,552, Cl. 374-160.000.
Kobayashi, Shigeru: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.
Kobold, Klaus. Device for the measurement of through-flow with potential-free end contact switch. 4,611,105, Cl. 200-81.90M.
Koch, Paul E.: *See*—
Catella, Gary C.; Cull, Ronald C.; Dilts, David A.; Koch, Paul E.; and Hartman, Robert A., 4,611,090, Cl. 136-251.000.
Kocher, Erich J., to Vilter Manufacturing Corporation. Rotary screw gas compressor having dual slide valves. 4,610,612, Cl. 418-195.000.
Koda, Yoshio: *See*—
Tsuchida, Yoshihiro; Tamura, Shigeru; and Koda, Yoshio, 4,610,497, Cl. 339-176.00L.
Kodama, Takuya: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, to Niigata Engineering Co., Ltd. Rotation control system for Z-type propulsion apparatus. 4,610,214, Cl. 114-144.00E.
Koebernick, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of 1,5-didesoxy-1,5-imino-D-glucitol and N-derivatives thereof. 4,611,058, Cl. 546-242.000.
Koerner, Robert M. Slope stabilization system and method. 4,610,568, Cl. 405-19.000.
Koester, Klaus: *See*—
Wilsberg, Heinz-Manfred; Puchta, Rolf; Koester, Klaus; and Carduck, Franz-Josef, 4,610,799, Cl. 252-90.000.
Koga, Minoru; Kizawa, Toshio; and Hirose, Toshio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Pipe handling apparatus for oil drilling operations. 4,610,315, Cl. 175-85.000.
Kohrtz, Sven-Ake: *See*—
Eriksson, Sven; Halldahl, Lars; and Kohrtz, Sven-Ake, 4,610,893, Cl. 427-34.000.
Koide, Teruhiko: *See*—
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, 4,610,480, Cl. 297-478.000.
Koike, Kazuyuki: *See*—
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Koike, Kazuyuki, 4,610,924, Cl. 428-331.000.
Koizumi, Kiyohide: *See*—
Hamada, Toyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; Jinriki, Tatenori; and Koizumi, Kiyohide, 4,610,598, Cl. 411-744.00A.
Koizumi, Kyogo: *See*—
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, 4,610,859, Cl. 423-347.000.
Koizumi, Yutaka, to Ricoh Co., Ltd. Apparatus for recording color images. 4,610,529, Cl. 355-4.000.
Kolling, Heinrich: *See*—
Haberkorn, Axel; Kolling, Heinrich; Kume, Toyohiko; and Kuyama, Shinpei, 4,611,060, Cl. 548-171.000.
Kolts, John H.; Figard, Joseph E.; Kimble, James B.; and Kubicek, Donald H., to Phillips Petroleum Company. Photochemical production of hydrogen from hydrogen sulfide. 4,610,766, Cl. 204-157.520.
Koltuniak, Thomas A.; and Lawrence, William A., to Eldon Industries, Inc. Circuit board and component manipulation device. 4,610,388, Cl. 228-6.200.
Kommoss, Klaus; Klos, Karl; Dietz, Hans W.; and Koppeler, Thomas H. W., to U.S. Philips Corporation. Control mechanism for a magnetic-tape-cassette apparatus. 4,611,254, Cl. 360-69.000.
Komori, Masanoshin: *See*—
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, 4,610,522, Cl. 354-173.100.
Kongoh, Takeshi: *See*—
Makabe, Hachiro; Tanaka, Haruhiko; and Kongoh, Takeshi, 4,610,211, Cl. 112-445.000.
Konig, Charles E.; and Skudera, William J., Jr., to United States of America, Army. Analog-to-digital converter. 4,611,194, Cl. 340-347.0SH.
Konishiroku Photo Industry Co., Ltd.: *See*—
Matsuzaka, Shoji; and Shimura, Shinya, 4,610,958, Cl. 430-567.000.
Koontz, Harry S., to PPG Industries, Inc. Method for utilizing magnetic field sensing means for detecting discontinuities in a conductor member associated with a glass sheet. 4,610,710, Cl. 65-29.000.
Kopp, Yvette B. Disposable diaper. 4,610,682, Cl. 604-385.00R.
Koppeler, Thomas H. W.: *See*—
Kommoss, Klaus; Klos, Karl; Dietz, Hans W.; and Koppeler, Thomas H. W., 4,611,254, Cl. 360-69.000.
Koppers, Manfred; Bohnes, Karlheinz; Guse, Kuno; and Amling, Friedel, to Bochumer Eisenhuette Heintzmann GmbH & Co Kg. Shut-off valve. 4,610,424, Cl. 251-121.000.
Kosman, Wilhelmus J. M., to 501 Machinefabriek de Boer B.V. Brick moulding device. 4,610,616, Cl. 425-99.000.
Kossmehl, Gerhard; and Hocker, Jurgen, to Chatzitheodorou, Georg. Oxidizing polymerization with $NO^{\oplus}$ and $NO_2^{\ominus}$. 4,611,032, Cl. 525-360.000.
Koster, Wilfried: *See*—
Gottwald, Adolf; and Koster, Wilfried, 4,610,272, Cl. 137-625.170.
Kotaka, Yoshiro: *See*—
Fukino, Kunihiro; and Kotaka, Yoshiro, 4,610,517, Cl. 350-580.000.
Kotitschke, Gerhard; and Benz, Wilhelm, to J. M. Voith GmbH. Device for threading a transfer strip of a paper web through the drying cylinder section of a paper machine. 4,610,097, Cl. 34-117.000.
Kowalczyk, Thaddeus. Air purifier for protecting motor vechicle occupants from pollution. 4,610,703, Cl. 55-274.000.
Kraatz, Udo; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal phenoxytriazolyl ketones and carbinols. 4,610,996, Cl. 514-383.000.
Kraiss, Richard, to Georg Prinzing GmbH & Co. KG Betonformen-Und Maschinenfabrik. Moulding apparatus for shaping concrete parts. 4,610,422, Cl. 249-94.000.
Kramer, Charles J., to Holotek Ltd. Hologon laser scanner apparatus. 4,610,500, Cl. 350-3.710.
Kramer, Francis J.; Park, Lester D.; and Massari, Donald J., Jr., to Senco Products, Inc. Drywall tool. 4,610,381, Cl. 227-7.000.
Kramer, Rolf-Jurgen: *See*—
Helmes, Ludger; and Kramer, Rolf-Jurgen, 4,610,340, Cl. 192-56.00R.
Krantz, Anders, to Industriell Arbetshygien i Soderhamn AB. Filter apparatus for air or gas purification. 4,610,702, Cl. 55-155.000.
Kras, Stephen J.: *See*—
Taber, James M.; and Kras, Stephen J., 4,610,621, Cl. 425-577.000.
Krause, Alvan A., to Draper Corporation. Counterbalanced lay motion for high speed weaving looms. 4,610,277, Cl. 139-191.000.
Krauth, Charles A.: *See*—
Shealy, Y. Fulmer; and Krauth, Charles A., 4,611,074, Cl. 558-51.000.
Krehan, Ingomar: *See*—
Marhold, Albrecht; Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Becker, Benedikt; Krehan, Ingomar; and Stendel, Wilhelm, 4,611,003, Cl. 514-452.000.
Kreiskott, Horst: *See*—
Albrecht, Hans P.; and Kreiskott, Horst, 4,610,817, Cl. 514-2.000.
Albrecht, Hans P.; and Kreiskott, Horst, 4,610,818, Cl. 514-19.000.
Krenedits, Sandor: *See*—
Gotz, Sandor; Krenedits, Sandor; and Szatmari, Ferenc, 4,611,268, Cl. 364-148.000.
Kriz, Thomas A.: *See*—
Andresen, Mark E.; Kriz, Thomas A.; and Potemski, Andrew S., 4,611,279, Cl. 364-200.000.
Krone, Bernard; and Ahler, Wilhelm, to Maschinenfabriken Bernard Krone GmbH. Apparatus for covering bales in baling presses. 4,610,123, Cl. 53-118.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Rotary constant velocity universal joint. 4,610,643, Cl. 464-143.000.

Kruger, Heinz; Teubler, Heinz; Schulz, Rene ; and Staemmler, Erwin, to Vickers Systems GmbH. Steering assistance pump. 4,610,607, Cl. 417-292.000.

Kruger, Robert J.: *See—*
Bilstad, Arnold C.; and Kruger, Robert J., 4,610,781, Cl. 210-85.000.

Kruger, Volker: *See—*
Jurgens, Rainer; and Kruger, Volker, 4,610,307, Cl. 175-320.000.

Krusche, Kurt. Match. 4,610,694, Cl. 44-42.000.

Kubala, Robert; LaPolla, Anthony; Raney, Donald; and Morse, Charles W., to General Signal Corporation. Micro controlled classification yard. 4,610,206, Cl. 104-26.00B.

Kubicek, Donald H.: *See—*
Kolts, John H.; Figard, Joseph E.; Kimble, James B.; and Kubicek, Donald H., 4,610,766, Cl. 204-157.520.

Kubota, Hitoshi; Otokuni, Tadaaki; Suzuki, Shoji; and Nakagawa, Keiji, to Nissan Motor Co., Ltd.; and Nippon Air Brake Co., Ltd. Brake device for controlling brake operation on inclines. 4,610,338, Cl. 192-13.00A.

Kubota, Ltd.: *See—*
Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, 4,610,127, Cl. 56-14.600.
Nakano, Keiichi; Umeda, Tatsutoshi; and Tani, Yoshio, 4,610,227, Cl. 123-182.000.
Takagi, Masao; and Watashi, Mitsuo, 4,610,174, Cl. 74-15.200.

Kudelski S.A.: *See—*
Kudelski, Stefan; and Rosselet, Ernest, 4,611,168, Cl. 324-174.000.

Kudelski, Stefan; and Rosselet, Ernest, to Ampex Corporation; and Kudelski S.A. Magnetic tachometer assembly. 4,611,168, Cl. 324-174.000.

Kudo, Mitsuhiro: *See—*
Kumasaka, Noriyuki; Fujiwara, Hideo; Saito, Noritoshi; Otomo, Shigekazu; Yamashita, Takeo; and Kudo, Mitsuhiro, 4,610,935, Cl. 428-632.000.

Kuen, Choy K.: *See—*
Ishihara, Naoki; and Kuen, Choy K., 4,610,048, Cl. 15-344.000.

Kugler, Fonderie et Robinetterie S.A.: *See—*
Rodriguez, Jean-Jacques, 4,610,393, Cl. 236-12.150.

Kuhle, Engelbert: *See—*
Fuhrer, Wolfgang; Kuhle, Engelbert; and Hanssler, Gerd, 4,610,985, Cl. 514-235.000.

Kuhlmann, Gerhard, to Robert Bosch GmbH. Motor-driven compass saw with saw blade holder. 4,610,088, Cl. 30-372.000.

Kuhn, Hans-Jurgen: *See—*
Buhse, Ulf H.; and Kuhn, Hans-Jurgen, 4,611,226, Cl. 358-144.000.

Kuhn, S.A.: *See—*
Ermacora, Rino, 4,610,128, Cl. 56-16.400.

Kumagai, Naotake; and Tatemoto, Minoru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Electronically controlled suspension system. 4,610,462, Cl. 280-707.000.

Kumar, Ashok; Segan, Ellen G.; and Bukowski, John M., to United States of America, Army. Pipe corrosion monitor. 4,611,175, Cl. 324-425.000.

Kumar, Mahesh, to RCA Corporation. Microwave frequency power divider. 4,611,184, Cl. 333-100.000.

Kumar, Sarbjeet S. Surgical staple. 4,610,251, Cl. 128-334.00R.

Kumasaka, Noriyuki; Fujiwara, Hideo; Saito, Noritoshi; Otomo, Shigekazu; Yamashita, Takeo; and Kudo, Mitsuhiro, to Hitachi, Ltd. Magnetic film structure. 4,610,935, Cl. 428-632.000.

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Kume, Toyohiko: *See—*
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Gaida, Walter E.; and Kun, Zoltan K., 4,610,754, Cl. 156-601.000.

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Hamada, Akira; Funakoshi, Akira; and Ohira, Keiichi, 4,611,141, Cl. 310-334.000.
Igarashi, Yuriko; and Takahashi, Masaaki, 4,610,927, Cl. 428-402.210.

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Theodorsen, Theodore E., 4,610,042, Cl. 12-142.00R.

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Hamada, Toyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; Jinriki, Tatenori; and Koizumi, Kiyohide, 4,610,598, Cl. 411-744.00A.

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Sugihara, Toshihiko, 4,610,289, Cl. 160-35.000.

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Ekholm, Pertti; and Kaukanen, Esko, 4,610,170, Cl. 73-864.220.

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Eastman, Curtis R., 4,610,344, Cl. 193-5.000.

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Dirmeyer, Josef; Kinzler, Hans; Lahner, Karlheinz; and Schulz, Hans-Werner, 4,611,185, Cl. 333-167.000.

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Galluccio, Richard A.; Lai, Chung-Yin; and Neveu, Christian D., 4,611,031, Cl. 525-310.000.

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Larue, Jean-Pierre; Duboz, Georges; Carsac, Claude; and Marhic, Gerard, 4,611,109, Cl. 219-121.0PY.

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LaLumiere, Edward J.: *See—*
Arzberger, William A.; Riley, Michael J.; LaLumiere, Edward J.; and DeCastro, William H., Jr., 4,610,145, Cl. 62-127.000.

Lambert Consolidated Industries, Inc.: *See—*
Heinlein, Joseph, 4,610,581, Cl. 409-132.000.

Lambrecht, Heinrich, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Gas burner. 4,610,623, Cl. 431-243.000.

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Lamere, Jean-Claude. Apparatus for reproducing a colored surface on a photographic emulsion. 4,610,535, Cl. 355-32.000.

Land, Pierre; and Meylan, Georges, to Bobst SA. Controlling system for mechanisms delivering sheets taken off from a pile in a processing machine. 4,610,444, Cl. 271-12.000.

Landi, Vincent R., to Rogers Corporation. Solderless connector apparatus and method of making the same. 4,610,495, Cl. 339-75.0MP.

Lane, Raymond P., to Dominion Chain Inc. Container conveyor system. 4,610,594, Cl. 414-71.000.

Langeder, Rudolf, to Voest-Alpine Internation Corporation. Apparatus for deburring of workpieces. 4,610,586, Cl. 409-300.000.

Langford, Edward A.; Neale, Reginald L.; and Morden, Geoffrey A., to PFD Limited. Manufacture of article having undercut internal surface. 4,610,155, Cl. 72-353.000.

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Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, 4,610,761, Cl. 162-157.600.

LaPolla, Anthony: *See—*
Kubala, Robert; LaPolla, Anthony; Raney, Donald; and Morse, Charles W., 4,610,206, Cl. 104-26.00B.

LaPrairie, Brian B. Sunglasses. 4,610,036, Cl. 2-12.000.

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Silvestrini, Thomas A.; and Laptewicz, Joseph E., Jr., 4,610,688, Cl. 623-1.000.

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Knox, Kenneth H.; and Larkin, Mark E., 4,610,684, Cl. 604-416.000.

Larson, Mikiel L.; and Toy, Wing N., to AT&T Bell Laboratories. Traffic load control arrangement and method for a packet switching system. 4,611,322, Cl. 370-60.000.

Larsson, Arne, to Svensk Termo-Ekonomi AB. Safety arrangement in gas-cutting lances. 4,610,434, Cl. 266-75.000.

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Lau, Cheuk K.: *See—*
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,611,056, Cl. 544-31.000.

Lau, Hans-Hermann: *See—*
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,610,999, Cl. 514-401.000.
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,611,000, Cl. 514-401.000.

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Sahler, John T.; and Laubach, Marianne G., 4,610,096, Cl. 33-565.000.

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Rogier, Leonce; and Lavaquerie, Jacques, 4,610,331, Cl. 188-18.00A.

Law, Malcolm J., to Inter Metals and Minerals, S.A. Electrodeposition of chromium and chromium bearing alloys. 4,610,763, Cl. 204-35.100.

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Overbeck, Joseph C.; Lawrence, Garth D.; and Golata, John H., 4,610,482, Cl. 301-63.00R.

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Leanza, William J.: *See—*
DiNinno, Frank P.; Leanza, William J.; and Ratcliffe, Ronald W., 4,610,823, Cl. 540-350.000.

Lease, Michael E.: *See—*
Martin, Eugene G.; and Lease, Michael E., 4,610,051, Cl. 17-11.000.

LeBlanc, Vincent G.; and Cameron, Allan B., to New Brunswick Telephone Company Limited, The. Telephone conference bridge system. 4,611,095, Cl. 179-18.0BC.

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Ebert, Charles; Viertel, Lothar; Lecorvaisier, Rene ; and Menschaert, Joseph, 4,610,477, Cl. 296-97.00K.

Lee, Ronald B.: *See—*
Srivastava, Gopal K.; and Lee, Ronald B., 4,611,229, Cl. 358-158.000.

Lee, William C., to ITT Corporation. Field component diversity antenna and receiver arrangement. 4,611,212, Cl. 343-351.000.

Lees, Ralph J., to Braman, Dow and Company. Foundation system and pile coupling for use therein. 4,610,571, Cl. 405-251.000.

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Kirkpatrick, Paul A.; Schulman, Marvin; Lehmann, Douglas M.; and Hegadorn, Joseph L., 4,610,760, Cl. 159-4.010.

Lehmann, Rolf: *See—*
Christ, Alfred; and Lehmann, Rolf, 4,610,617, Cl. 425-143.000.

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Schulein, Rolf G., 4,610,044, Cl. 15-119.00R.

Leigh, Harold G.: *See—*
Ewalt, Paul R.; Leigh, Harold G.; and Gilson, Richard W., 4,610,672, Cl. 604-220.000.

Leitl, Franz; and Schulte-Hubbert, Georg. Radar device. 4,611,211, Cl. 343-9.00R.

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McGill, Kevin C.; and Dorfman, Leslie J., 4,611,284, Cl. 364-417.000.

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Brody, William R., 4,611,341, Cl. 378-99.000.

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Lendaro, Jeffery B.: *See—*
Hoover, Alan A.; Luz, David W.; and Lendaro, Jeffery B., 4,611,151, Cl. 315-368.000.

Lenz, Dieter: *See—*
Gold, Ernst; Tragner, Erich; and Lenz, Dieter, 4,610,070, Cl. 29-429.000.

Leonhardt, Heinz: *See—*
Massott, Philipp; and Leonhardt, Heinz, 4,610,367, Cl. 215-252.000.

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Leuchte, Michael: *See—*
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Leung, Pak S.: *See—*
Goddard, Errol D.; Leung, Pak S.; and Mohr, Paul H., 4,610,222, Cl. 123-41.420.

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Jomes, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,611,014, Cl. 521-146.000.
Schmidt, Werner J., 4,610,889, Cl. 426-602.000.

Levinson, Samuel H.; and Caldicott, Jack R. Security and communication system. 4,611,198, Cl. 340-539.000.

Levon, Kalle: *See—*
Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, 4,610,809, Cl. 252-500.000.

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Lewis, Robert T.; Dwyer, George F., Jr.; and Payne, John W., to Race-Rail, Inc. Break-away fence for horse race tracks. 4,610,432, Cl. 256-65.000.

Lewis, Terrence E.; Smiley, Stephen A.; Rice, Rex; Lipkes, Zeev; and Nelson, John A., to Burroughs Corporation. Integrated circuit package incorporating low-stress omnidirectional heat sink. 4,611,238, Cl. 357-81.000.

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Lautenschlager, Hans-Heiner; Graf, Erich; and Leyck, Sigurd, 4,610,979, Cl. 514-77.000.

Li, Hsin L.: *See—*
Akkapeddi, Murali K.; DeBona, Bruce T.; Li, Hsin L.; and Prevorsek, Dusan C., 4,611,025, Cl. 524-449.000.

Librecht, Freddy M.: *See—*
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,610,532, Cl. 355-14.00D.

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Eisbrenner, Dietrich; and Merk, Hans, 4,610,892, Cl. 427-27.000.
Muller, Ernst-August, 4,610,359, Cl. 209-3.100.

Lillicrap, Douglas C., to Electricity Council, The. Channel induction furnaces. 4,611,338, Cl. 373-161.000.

Linco Holland Engineering B.V.: *See—*
Tieleman, Rudolf J.; and Ruesen, Ritsaert L. J. M., 4,610,050, Cl. 17-11.000.

Lindberg, J. Johan: *See—*
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Linde Aktiengesellschaft: *See—*
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Linde, Yoseph L.: *See—*
Peterson, Benjamin C.; Linde, Yoseph L.; and Brandman, Yigal, 4,611,133, Cl. 307-465.000.

Linderman, John P., to AT&T Bell Laboratories. Sorting method. 4,611,280, Cl. 364-300.000.

Lindsay, Gary L.: *See—*
Albang, Nicholas P.; Lindsay, Gary L.; and Foster, Daniel F., 4,610,566, Cl. 404-4.000.

Ling, Hung C.: *See—*
Haynes, Richard; Ling, Hung C.; and Ng, Sau-Lan L., 4,610,932, Cl. 428-611.000.

Ling, Nicholas C.: *See—*
Bohlen, Peter; Esch, Frederick S.; Ling, Nicholas C.; Brazeau, Paul E., Jr.; and Guillemin, Roger C. L., 4,610,976, Cl. 514-12.000.

Linnola Ltd.: *See—*
Keane, James, 4,610,729, Cl. 134-25.100.

Linscott, John D., to Wayne Boren Corporation. Dual glazed insulatable stained glass window and method of making same. 4,610,901, Cl. 428-38.000.

Lionetti, Thomas A.: *See—*
Colvert, James H.; and Lionetti, Thomas A., 4,610,851, Cl. 422-310.000.

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Lewis, Terrence E.; Smiley, Stephen A.; Rice, Rex; Lipkes, Zeev; and Nelson, John A., 4,611,238, Cl. 357-81.000.

Liposome Company, Inc., The: *See—*
Fountain, Michael W.; Weiss, Steven J.; Kearns, John J.; Weiner, Alan L.; and Popescu, Mircea C., 4,610,868, Cl. 424-1.100.

Lipscomb, Robert L.; Cargle, Virgil H.; and Bausano, Domenick, to Exxon Chemical Patents Inc. Recovery of fugitive dust. 4,610,897, Cl. 427-212.000.

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Rudy, Michael A.; and Lisanti, Vincent F., 4,610,873, Cl. 424-52.000.

Liu, Jia-Ming; and Chen, Ying C., to GTE Laboratories Incorporated. Polarization stabilized InGaAsP/InP lasers. 4,611,328, Cl. 372-45.000.

Liu, Thomas M. H.: *See—*
Volante, Ralph P.; Verhoeven, Thomas R.; Sletzinger, Meyer; McNamara, James M.; Liu, Thomas M. H.; and Corley, Edward G., 4,611,067, Cl. 549-292.000.

Llinares, Michel: *See—*
Bernasconi, Christian; Llinares, Michel; and Nouguier, Robert, 4,610,696, Cl. 44-56.000.

Lloyd, Norman E.: *See—*
Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,610,965, Cl. 435-234.000.

Lo, Young S.; and Cale, Albert D., Jr., to A. H. Robins Company, Inc. Process for the preparation of aromatic-1,4-oxazepinones and thiones. 4,610,819, Cl. 540-488.000.

Lohmann, Manfred: *See*—
Andrae, Wolfhart; Andrae, Hans P.; Beyer, E. H. Erwin; Bayer, Karl; and Lohmann, Manfred, 4,610,431, Cl. 254-93.0HP.

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Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,611,041, Cl. 526-298.000.

Lombardino, Joseph G., to Pfizer Inc. Anti-inflammatory benzo- and thieno-1,2-thiazine-3-carboxamide 1,1-dioxide derivatives, compositions, and method of use therefor. 4,610,982, Cl. 514-225.000.

Lombardo, Leo, to Moore Business Forms, Inc. Web perforating utilizing a single perf cylinder and dual anvils. 4,610,189, Cl. 83-30.000.

Lomet, David B., to International Business Machines Corporation. Key-accessed file organization. 4,611,272, Cl. 364-200.000.

Lompe, Arved, to Miles Kali-Chemie GmbH & Co. KG. Novel microorganism and its use in a process for the preparation of alpha amylase. 4,610,964, Cl. 435-202.000.

Long, Ray A., to Allis-Chalmers Corporation. Apparatus for controlling a hydraulic turbine. 4,610,599, Cl. 415-15.000.

Lonky, Martin L., to Westinghouse Electric Corp. Drain triggered N-channel non-volatile memory. 4,611,308, Cl. 365-184.000.

LOR, Inc.: *See*—
Boaz, James, 4,610,316, Cl. 175-323.000.

L'Oreal: *See*—
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Gabrielli, Luciano; Lotito, Nicola; and Sposini, Maurizio, 4,611,321, Cl. 370-60.000.

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Lovell, Charles J.: *See*—
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Steklenski, David J.; Upson, Donald A.; and Low, Howard M., 4,611,027, Cl. 524-815.000.

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Lubcke, Kip C. Shellfish opening tool. 4,610,052, Cl. 17-75.000.

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Van Doorn, Donald W.; Hawkins, James B.; Harmon, William A.; McKenzie, Terry L.; and Hollingsworth, Michael A., 4,610,575, Cl. 406-113.000.

Lunke, Manfred: *See*—
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Luther, Ronald B., 4,610,671, Cl. 604-168.000.

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Meives, Otis E.; and Lutzke, Anthony, 4,610,125, Cl. 53-462.000.

Lutzmann, H. Harald; and Miller, Gerald W. Enhanced barrier compositions from polyvinyl alcohol. 4,611,019, Cl. 524-169.000.

Luz, David W.: *See*—
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Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., to Merck & Co., Inc. Process for the preparation of HMG-CoA reductase inhibitors intermediates. 4,611,081, Cl. 560-53.000.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,610,871, Cl. 424-48.000.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,610,872, Cl. 424-49.000.

Lyster, Thomas D.: *See*—
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,610,254, Cl. 128-419.00D.

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Machida, Toyotaka; Ueguri, Shigeharu; Matsumoto, Hiroaki; Nakamura, Akira; and Shinyagaito, Tatsuya, to Victor Company of Japan, Ltd. Scan line synchronizer. 4,611,228, Cl. 358-149.000.

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Pols, Pieter M., 4,610,199, Cl. 100-269.00R.

Machino, Katsuyuki; Ise, Masahiro; and Tanaka, Hidehiko, to Sharp Kabushiki Kaisha. Data transmission system via power supply line. 4,611,274, Cl. 364-200.000.

MacIver, Bernard A., to General Motors Corporation. Junction-MOS power field effect transistor. 4,611,220, Cl. 357-23.700.

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Barnes, Derek, 4,610,913, Cl. 428-215.000.

Madeley, David R., to Lucas Industries. Temperature compensated resistance bridge circuit. 4,611,163, Cl. 323-367.000.

Madrange, Annie G.; and Refregier, Jean-Louis L., to L'Oreal. Process for treating the hair and in particular the tips of the hair and device for carrying out the said process. 4,610,261, Cl. 132-7.000.

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Magnenet, Jean: *See*—
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Mahn, John E., Sr.; and Mahn, John E., Jr., to Mahn, John E., Sr. Heat activated removable ornamental transfer. 4,610,904, Cl. 428-79.000.

Mahoney, John E., to General Motors Corporation. Preselected multiratio transmission. 4,610,177, Cl. 74-330.000.

Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, to Ciba-Geigy Corporation. 1,2-dinitro-4-(3'-chloro-5'-trifluoromethyl)-2-pyridyloxy-benzene having herbicidal properties. 4,610,980, Cl. 514-94.000.

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Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., to Johns Hopkins University, The. Means and method for the noninvasive fragmentation of body concretions. 4,610,249, Cl. 128-328.000.

Malian, Thomas. Clipboard with releasable fastening means for attachment of accessories. 4,610,054, Cl. 24-67.00R.

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Malm, Curtis L., to Gillette Company, The. Mechanical pencil with groove and lug structure. 4,610,557, Cl. 401-75.000.

Maloney, Terrance R. Pitch raising system for guitars. 4,610,190, Cl. 84-312.00R.

Maltiel, Ron: *See*—
Chuang, Patrick T.; Maltiel, Ron; and Yau, Robert L., 4,611,309, Cl. 365-185.000.

Malzkorn, Matthias; and Holz, Helmut, to Scharmann GmbH & Co. Horizontal drilling and milling machine. 4,610,583, Cl. 409-211.000.

Malzkorn, Matthias; and Holz, Helmut, to Scharmann GmbH & Co. Horizontal drilling and milling machine having a spindle head which can be rotated about an axis set at 45 degrees to the horizontal. 4,610,584, Cl. 409-211.000.

Mampaey, Jozef L.; and Remmerie, Herman J., to AGFA-GEVAERT N.V. Method and apparatus for the transfer of an electrostatically deposited toner image. 4,610,939, Cl. 430-33.000.

Manabe, Akio; Hisada, Yoshio; and Furuzawa, Kunihiko, to Sumitomo Chemical Company, Limited. Fungicidal N-acylimidazoles. 4,610,997, Cl. 514-397.000.

Managadze, Georgy G., to Institut Kosmicheskish Issledovany Akademi Nauk SSS. Time-of-flight ion mass analyzer. 4,611,118, Cl. 250-287.000.

Mango, Carmine M., to Branson Ultrasonics Corporation. Ultrasonic cut and seal apparatus. 4,610,750, Cl. 156-510.000.

Maniguet, Francois: *See*—
Dolizy, Pierre; Groliere, Francoise; and Maniguet, Francois, 4,611,114, Cl. 250-211.00R.

Mann, Kenneth G.: *See*—
Giles, Alan R.; and Mann, Kenneth G., 4,610,880, Cl. 424-101.000.

Mannesmann Rexroth GmbH: *See*—
Cunningham, Sinclair; and Wusthof, Peter, 4,610,195, Cl. 91-488.000.

MANRESA, Inc.: *See*—
Vaillancourt, Vincent L., 4,610,683, Cl. 604-405.000.

Mansuri, Muzammil M.; and McArthur, Alasdair, to Shell Oil Company. Certain 5-(R-oxy)-1-phenyl or (3-(trifluoromethyl)phenyl)-triazoles, useful for controlling undesired plant growth. 4,610,717, Cl. 71-92.000.

Manville Service Corporation: *See*—
Eastman, Robert J.; and Goodspeed, Henry S., 4,610,902, Cl. 428-57.000.

Marathon Oil Company: *See*—
Christiansen, Richard L., 4,610,160, Cl. 73-151.000.

Marec, Jean: *See*—
Leprince, Philippe; Bloyet, Emile; and Marec, Jean, 4,611,108, Cl. 219-121.0PR.

Maresca, Louis M., to Union Carbide Corporation. Process for stabilizing a poly(aryl ether ketone). 4,611,033, Cl. 525-419.000.

Marhic, Gerard: *See*—
Larue, Jean-Pierre; Duboz, Georges; Carsac, Claude; and Marhic, Gerard, 4,611,109, Cl. 219-121.0PY.

Marhold, Albrecht; Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Becker, Benedikt; Krehan, Ingomar; and Stendel, Wilhelm,

to Bayer Aktiengesellschaft. N-substituted benzoyl-N'-3,4-tetrafluoroethylenedioxy-urea pesticides. 4,611,003, Cl. 514-452.000.
Mark, F. Fausten: *See*—
Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., 4,610,249, Cl. 128-328.000.
Markland, Francis S., Jr.; and Reddy, Nagendranath K., to University of Southern California. Fibrinolytic enzyme from snake vernom. 4,610,879, Cl. 424-94.000.
Markley, Gerald E.; and Spry, James C., Jr., to Exxon Research and Engineering Co. Process for the hydrogenation of aromatic hydrocarbons. 4,610,779, Cl. 208-212.000.
Marko, Neil L.: *See*—
Bolger, Robert M.; and Marko, Neil L., 4,610,129, Cl. 56-17.500.
Mars, Inc.: *See*—
Eglise, David, 4,611,205, Cl. 340-825.350.
Marshall, Fray F.: *See*—
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Marshik, Gary J. Balance spring locking slide block for tilt-out windows. 4,610,108, Cl. 49-181.000.
Marsico, Joseph W., Jr.; and Wright, William B., Jr., to American Cyanamid Company. N-[(1H-imidazol-1-yl) and (1H-1,2,4-triazol-1-yl)-alkyl]benzenesulfonamides and thromboxane synthetase/antihypertensive compositions. 4,610,981, Cl. 514-158.000.
Martin, Alexander: *See*—
Jomes, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,611,014, Cl. 521-146.000.
Martin, Eugene G.; and Lease, Michael E., to Favorite Manufacturing, Inc. Turkey thigh skinner. 4,610,051, Cl. 17-11.000.
Martin, Fred D.; Hatch, Melvin J.; Shepitka, Joel S.; and Donaruma, Lorraine G., to New Mexico Institute of Mining and Technology, The. Oilfield flooding polymer. 4,610,305, Cl. 166-275.000.
Martin, Hans. Compartmentalized centrifugation chamber. 4,610,846, Cl. 422-101.000.
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Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,610,984, Cl. 514-235.000.
Marx, Matthias: *See*—
Buethe, Ingolf; Marx, Matthias; and Schonleben, Willibald, 4,611,083, Cl. 560-351.000.
Maschinenfabriken Bernard Krone GmbH: *See*—
Krone, Bernard; and Ahler, Wilhelm, 4,610,123, Cl. 53-118.000.
Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Process of manufacturing electrochemical device. 4,610,741, Cl. 156-89.000.
Masek, Richard C., to Babcock & Wilcox Company, The. Electrical connector block. 4,610,493, Cl. 339-14.00R.
Massari, Donald J., Jr.: *See*—
Kramer, Francis J.; Park, Lester D.; and Massari, Donald J., Jr., 4,610,381, Cl. 227-7.000.
Massey, Joe T.: *See*—
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Massott, Philipp; and Leonhardt, Heinz, to Vaw-Folien-Verarbeitung GmbH. Tamper-proof closure. 4,610,367, Cl. 215-252.000.
Mastroianni, Dominic M. Drive notching tool. 4,610,086, Cl. 30-135.000.
Masuda, Toshiyuki; and Yamamoto, Nobuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium and process for producing the same. 4,610,930, Cl. 428-694.000.
Matarese, Alfred P.: *See*—
Eaton, Harry E.; Novak, Richard C.; and Matarese, Alfred P., 4,610,698, Cl. 51-295.000.
Matesa, Joseph M.; Won, Kwang J.; and Demarest, Henry M., Jr., to PPG Industries, Inc. Method and apparatus for inductively heating molten glass or the like. 4,610,711, Cl. 65-134.000.
Mathews, H. Wayne: *See*—
Ray, Jimmy C.; and Mathews, H. Wayne, 4,611,099, Cl. 179-175.000.
Matravers, Peter, to Neutrogena Corporation. Hair conditioner. 4,610,874, Cl. 424-70.000.
Matsuda, Hiroto: *See*—
Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, 4,611,219, Cl. 346-140.00R.
Matsuda, Yasuo: *See*—
Nagase, Hiroshi; Matsuda, Yasuo; and Ninomiya, Hisakazu, 4,611,158, Cl. 318-803.000.
Matsuda, Yoichi: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Matsui, Hiroshi: *See*—
Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, 4,611,221, Cl. 357-30.000.
Matsui, Isamu, to Murata Kikai Kabushiki Kaisha. Bobbin supplying system. 4,610,406, Cl. 242-35.50A.
Matsui, Minoru: *See*—
Imanishi, Yuichiro; and Matsui, Minoru, 4,610,967, Cl. 501-103.000.
Matsui, Susumu; Uchida, Satoko; and Taniguchi, Tsutomu, to Takara Suzo Co., Ltd. Novel glutathione oxidase, its production and use. 4,610,963, Cl. 435-189.000.
Matsukawa, Naohiro; and Nozawa, Hiroshi, to Kabushiki Kaisha Toshiba. Method of making high density dielectric isolated gate MOS transistor. 4,610,078, Cl. 29-576.00B.
Matsumoto, Atsushi; and Suzuki, Tatsuo, to Terumo Kabushiki Kaisha. Medical instrument. 4,610,665, Cl. 604-167.000.
Matsumoto, Atsushi: *See*—
Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,610,674, Cl. 604-282.000.
Matsumoto, Fumio, to Fuji Photo Film Co., Ltd. Photographic image information detecting device. 4,610,537, Cl. 355-68.000.
Matsumoto, Hiroaki: *See*—
Machida, Toyotaka; Ueguri, Shigeharu; Matsumoto, Hiroaki; Nakamura, Akira; and Shinyagaito, Tatsuya, 4,611,228, Cl. 358-149.000.
Matsumoto, Kazuhiko: *See*—
Ono, Shigetoshi; Nakamura, Shigeru; and Matsumoto, Kazuhiko, 4,610,959, Cl. 430-598.000.
Matsumoto, Masakazu: *See*—
Takiguchi, Takao; Miyazaki, Hajime; Matsumoto, Masakazu; and Ishikawa, Shozo, 4,610,943, Cl. 430-76.000.
Matsumoto, Toru; Yamazaki, Masuo; and Wakamiya, Katsutoshi, to Canon Kabushiki Kaisha. Production of toner. 4,610,944, Cl. 430-135.000.
Matsumoto, Yukio; and Takayama, Toshio, to Tokico Ltd. Vehicle brake system. 4,610,483, Cl. 303-97.000.
Matsunaga, Makoto: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Matsuno, Hiromitsu: *See*—
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.
Matsuoka, Katsumi; and Mikami, Takeshi, to Fuji Photo Film Co., Ltd. Encapsulated toner having improved image-forming characteristics. 4,610,945, Cl. 430-138.000.
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Fujito, Katsuyuki; Nakata, Hiroaki; and Ichida, Takeshige, 4,611,352, Cl. 455-609.000.
Hasegawa, Yo; Murakawa, Satoshi; and Shimazaki, Yukihiro, 4,610,810, Cl. 252-511.000.
Igata, Kouichi; and Kobayashi, Masaaki, 4,611,252, Cl. 360-10.300.
Kikutani, Fumitaka; Furumai, Koro; Indou, Masahiro; and Fujishita, Kazuo, 4,610,626, Cl. 431-351.000.
Kobayashi, Masaaki, 4,611,231, Cl. 358-160.000.
Oku, Kenichi; and Suzuki, Masaki, 4,610,442, Cl. 269-73.000.
Setsune, Kentaro; Yamazaki, Osamu; Wasa, Kiyotaka; and Tazuke, Kazuo, 4,610,894, Cl. 427-53.100.
Matsushita Electronics Corporation: *See*—
Ueda, Seiji, 4,610,076, Cl. 29-571.000.
Matsushita, Masao. Bedsore-free diaper. 4,610,679, Cl. 604-369.000.
Matsuura, Masataka: *See*—
Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, 4,610,510, Cl. 350-334.000.
Matsuura, Syuuji, to Sharp Kabushiki Kaisha. Wide-band type high-frequency amplifier circuit. 4,611,179, Cl. 330-293.000.
Matsuura, Takashi: *See*—
Fukumura, Yukio; and Matsuura, Takashi, 4,611,181, Cl. 331-66.000.
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Matsuzaki, Makoto: *See*—
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Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., to Bernard Matthews plc. Method of making a coextrudate of meat and fat. 4,610,844, Cl. 426-641.000.
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., to Blue Circle Industries PLC. Compositions comprising mineral particles in suspension and method of treating aqueous systems therewith. 4,610,801, Cl. 252-181.000.
Mattila, Heikki. Upper body protector. 4,610,035, Cl. 2-2.000.
Maurer, Donald J., to Amana Refrigeration, Inc. Shipping base having an entry slot for mechanical material handling equipment. 4,610,355, Cl. 206-386.000.
Mauries, Reinhard: *See*—
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,610,132, Cl. 57-22.000.
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Finn, Lyle D.; and Maus, Leo D., 4,610,569, Cl. 405-202.000.
Mavel, Gerard: *See*—
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Max-Planck Gesellschaft Zur Forderung der Wissenschaften: *See*—
Wissler, Josef H., 4,610,815, Cl. 530-380.000.
Maxwell, Ian: *See*—
East, John; and Maxwell, Ian, 4,610,725, Cl. 75-228.000.

Mayerhoefer, Horst: *See—*
Hinsken, Hans; Mayerhoefer, Horst; Mueller, Wolfgang; and Schneider, Hermann, 4,611,016, Cl. 529-99.000.
Mayhew, Roger D.; and Reak, B. Bennett, to Weasler Engineering, Inc. Shield for universal joint. 4,610,559, Cl. 403-23.000.
Mazda Motor Corp.: *See—*
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.
Nobumoto, Kazutoshi; and Sumida, Shizuo, 4,610,183, Cl. 74-866.000.
Okino, Yoshinori, 4,610,236, Cl. 123-585.000.
Mazur, Edward J.: *See—*
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., 4,610,753, Cl. 156-552.000.
McArthur, Alasdair: *See—*
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McArthur, Hamish: *See—*
Baker, Bruce G.; Clark, Neville J.; McArthur, Hamish; and Summerville, Edward, 4,610,975, Cl. 502-302.000.
McCallister, Ronald D.; Cochran, Bruce A.; and Bogner, Mary A., to Motorola, Inc. Apparatus for despreading a spread spectrum signal produced by a linear feedback shift register (LFSR). 4,611,333, Cl. 375-1.000.
McClure, Richard J., to Eastman Kodak Company. Flux sensitive tracking. 4,611,249, Cl. 360-77.000.
McDonald, Duncan R., to Fairchild Camera and Instrument Corporation. High voltage analog solid state switch. 4,611,123, Cl. 250-551.000.
McFiggans, Robert B., to Pitney Bowes Inc. Postage meter using a flag to indicate interuption of accounting register updating due to power failure or microprocessor failure. 4,611,282, Cl. 364-406.000.
McGill, Kevin C.; and Dorfman, Leslie J., to Leland Stanford, Jr. University, The Board of Trustees of the. Method for decomposing an electromyogram into individual motor unit action potentials. 4,611,284, Cl. 364-417.000.
McIntyre, Norman S.: *See—*
Bancroft, G. Michael; Chauvin, William J.; McIntyre, Norman S.; and Metson, J. Bernard, 4,611,120, Cl. 250-307.000.
McKenzie, Lee F.: *See—*
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McKenzie & Ridley Limited: *See—*
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McKenzie, Terry L.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Harmon, William A.; McKenzie, Terry L.; and Hollingsworth, Michael A., 4,610,575, Cl. 406-113.000.
McKinney, Linda M.: *See—*
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McKinney, Osborne K.; and Flores, David P., to Dow Chemical Company, The. Stabilized carboxyl-containing ethylene interpolymers. 4,611,017, Cl. 524-119.000.
McLane, Allan, Jr.: *See—*
Hausmann, Scott; and McLane, Allan, Jr., 4,610,292, Cl. 160-120.000.
McMurray, William, to General Electric Company. Snubber arrangements with energy recovery for power converters using self-extinguishing devices. 4,611,267, Cl. 363-58.000.
McNamara, James M.: *See—*
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McNamara, John E., to Digital Equipment Corporation. Circuitry for identifying the validity of received data words. 4,611,326, Cl. 371-47.000.
McNeilly, David R.: *See—*
Jatko, W. Bruce; McNeilly, David R.; and Thacker, Louis H., 4,611,176, Cl. 328-184.000.
McNett, John P.: *See—*
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,610,640, Cl. 446-329.000.
McShane, James L., to Westinghouse Electric Corp. Apparatus for measuring flow velocity of fluids. 4,610,167, Cl. 73-861.280.
Mead, Barry B.: *See—*
Piosenka, Gerald V.; and Mead, Barry B., 4,611,183, Cl. 331-78.000.
Meade, Ronald G., to Hills Industries Limited. Clothes dryer lower cross assembly. 4,610,364, Cl. 211-183.000.
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Fuchs, Ernst; Berger, Eduard; and Fitzi, Karl, 4,610,281, Cl. 140-140.000.
Medical Engineering Corporation: *See—*
Densow, David C., 4,610,657, Cl. 604-8.000.
Medical University of South Carolina: *See—*
Wilson, Gregory B.; and Fudenberg, Herman H., 4,610,878, Cl. 424-88.000.
Meditec S.A.: *See—*
Meyer, Gabriel; and Howald, Ernst, 4,610,669, Cl. 604-218.000.
Mednikarov, Vladimir S.: *See—*
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Meek, Dale E., to Schlumberger Technology Corporation. Bottom hole sampler and safety valve and valve therefor. 4,610,308, Cl. 166-321.000.
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Meives, Otis E.; and Lutzke, Anthony, to PEMCO Inc. Method and apparatus for confining wrapped reams of paper sheets in cardboard boxes. 4,610,125, Cl. 53-462.000.
Melkonian, Diran: *See—*
Gold-Aubert, Philippe; Melkonian, Diran; Vachta, Jindrich; Valter, Karel; Siegfried, Bernard; and Hugentobler, Stephane, 4,611,057, Cl. 544-301.000.
Memtek Corporation: *See—*
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Merck & Co., Inc.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,610,820, Cl. 540-200.000.
DiNinno, Frank P.; Leanza, William J.; and Ratcliffe, Ronald W., 4,610,823, Cl. 540-350.000.
Freidinger, Roger, 4,611,054, Cl. 530-311.000.
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., 4,611,081, Cl. 560-53.000.
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Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Process for the preparation of N-aryl di- or polyurethanes. 4,611,079, Cl. 560-25.000.
Merk, Hans: *See—*
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Merkel, Volkmar: *See—*
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Merlin Gerin: *See—*
Souchere, Claude, 4,611,191, Cl. 336-84.00R.
Mertens, Hans-Jurgen: *See—*
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Merz, S. Spencer: *See—*
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Merz, Steven G.: *See—*
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Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
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Messier-Hispano-Bugatti (S.A.): *See—*
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Metallwerk K. Pittl Ges.mbH & Co. KG: *See—*
Jungkind, Roland, 4,610,459, Cl. 280-615.000.
Metso, Matti. Arrangement in silk screen printers for positioning a second pattern deriving from a first pattern located on a stencil in relationship with an intended location on material to be printed. 4,610,200, Cl. 101-126.000.
Metson, J. Bernard: *See—*
Bancroft, G. Michael; Chauvin, William J.; McIntyre, Norman S.; and Metson, J. Bernard, 4,611,120, Cl. 250-307.000.
Mexicotte, Joseph. Courier clipboard and scale case. 4,610,324, Cl. 177-245.000.
Meyer, Gabriel; and Howald, Ernst, to Meditec S.A. Prefilled ampoule-syringe of unitary dose. 4,610,669, Cl. 604-218.000.
Meyer, Louis W.; McKinney, Linda M.; and Kelley, Don H., to Dow Chemical Company, The. Polyurethane carpet backing catalyzed with organoiron and organobismuth catalysts. 4,611,044, Cl. 528-56.000.
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, to Bayer Aktiengesellschaft. Branched thermoplastically processible impact-resistant polyamides. 4,611,034, Cl. 525-420.000.
Meylan, Georges: *See—*
Land, Pierre; and Meylan, Georges, 4,610,444, Cl. 271-12.000.
Michael, Dietrich: *See—*
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, 4,611,034, Cl. 525-420.000.
Michael Horauf Maschinenfabrik GmbH & Co. KG: *See—*
Muller, Berthold, 4,610,655, Cl. 493-108.000.
Mickelson, Jim; and Winfield, Barbara L., to State of New Mexico. Eating utensil for correctional institutions. 4,610,087, Cl. 30-147.000.

Mickle, Marlin H.; and Pulyer, Yuly M., to University of Pittsburgh. Induction feedback stabilized suspension gyroscope. 4,610,172, Cl. 74-5.460.
Microflex Technology, Inc.: *See*—
Heiserman, David L., 4,610,475, Cl. 294-86.400.
Microlite, Inc.: *See*—
Ball, Ervin M.; and Hutson, Jack E., 4,611,150, Cl. 315-307.000.
Mietus, David F.: *See*—
Naylor, Jimmy R.; and Mietus, David F., 4,611,178, Cl. 330-272.000.
Mihara, Takeshi, to UBE Industries. Method of controlling cylinder speed in injection molding apparatus. 4,610,831, Cl. 264-40.700.
Mikami, Takeshi: *See*—
Matsuoka, Katsumi; and Mikami, Takeshi, 4,610,945, Cl. 430-138.000.
Mikami, Yoshiharu: *See*—
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Miki, Toshiharu: *See*—
Kuramoto, Tohru; Miki, Toshiharu; Nishino, Kozo; and Ono, Hiroshi, 4,610,864, Cl. 423-344.000.
Mikoshiba, Shigeo: *See*—
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.
Mikulecky, Harvey W., to RTE Corporation. Underoil primary circuit breaker. 4,611,189, Cl. 335-37.000.
Milburn, William W., Jr. Sealing apparatus for device having variable volume chambers. 4,610,609, Cl. 417-466.000.
Miles Kali-Chemie GmbH & Co. KG: *See*—
Lompe, Arved, 4,610,964, Cl. 435-202.000.
Milewits, Marvin: *See*—
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,611,170, Cl. 324-229.000.
Miller, Calvin E. Rosette ribbon and method for making the same. 4,610,899, Cl. 428-4.000.
Miller, David P. J. Oil extraction method. 4,610,793, Cl. 210-767.000.
Miller, Dennis H.; and Mutka, Jerry R., to Sunkist Growers, Inc. Preparation of solid essential oil flavor composition. 4,610,890, Cl. 426-651.000.
Miller, Dennis R.; and Barnett, Eugene R. Fire protection system. 4,610,310, Cl. 169-37.000.
Miller, Gerald W.: *See*—
Lutzmann, H. Harald; and Miller, Gerald W., 4,611,019, Cl. 524-169.000.
Miller, James A.: *See*—
Barker, Gary T.; and Miller, James A., 4,610,193, Cl. 91-420.000.
Miller, Melvin M., to Channel-KOR Systems Inc. Panel display connector. 4,610,560, Cl. 403-119.000.
Miller, Peter A., to Werkzeugmaschinenfabrik Oerlikon-Buehrle AG. Power on/off reset generator. 4,611,126, Cl. 307-64.000.
Miller, Richard E. Method of forming foam filled baseball or softball. 4,610,071, Cl. 29-458.000.
Miller, Richard F.; and Blaschke, Marilyn W., to Atlantic Richfield Company. Preparation of higher silicon carboxylates in improved yields using an inert gas. 4,611,073, Cl. 556-442.000.
Miller, Robert E.: *See*—
Bodmer, Jerome R.; and Miller, Robert E., 4,610,727, Cl. 106-21.000.
Miller, Robert J., to Decision Data Computer Corporation. Tiltable support. 4,610,415, Cl. 248-455.000.
Miller, Timothy J. E.; and Bass, James T., to General Electric Company. Switched reluctance motor drive operating without a shaft position sensor. 4,611,157, Cl. 318-696.000.
Miller, William C.; Dunne, Stephen R.; and Ausikaitis, Joseph P., to Union Carbide Corporation. Adsorbent composition useful in retarding corrosion in mufflers. 4,610,700, Cl. 55-35.000.
Miller, William J.; Chiu, Ran F.; Joerger, Richard B.; and Newdeck, Frank W., to Racal Data Communications Inc. Digital voice compression having a digitally controlled AGC circuit and means for including the true gain in the compressed data. 4,611,342, Cl. 381-36.000.
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Eschenbach, Paul W.; and Goineau, Andre M., 4,610,131, Cl. 57-6.000.
Lesley, Bascum G., 4,610,619, Cl. 425-388.000.
Milliken, Robert D., to W. R. Grace KK. Method of producing printing plates. 4,610,950, Cl. 430-306.000.
Milwaukee Electric Tool Corporation: *See*—
Palm, Bernhard, 4,610,580, Cl. 408-136.000.
Minagawa, Hidenobu: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; and Minagawa, Hidenobu, 4,611,301, Cl. 365-207.000.
Minahan, Joseph A.; Ralph, Eugene L.; and Dill, Hans G., to Hughes Aircraft Company. Process for fabricating a wraparound contact solar cell. 4,610,077, Cl. 29-572.000.
Minami, Hiroshi, to Kabushiki Kaisha Toshiba. X-ray image tube. 4,611,144, Cl. 313-373.000.
Minami, Ryuichi: *See*—
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Minato, Akira: *See*—
Sasaki, Yuko; Suzuki, Katsumi; Minato, Akira; and Yoshida, Tomio, 4,610,732, Cl. 148-6.14R.
Minnesota Mining and Manufacturing Company: *See*—
Brown-Wensley, Katherine A.; and Sinclair, Robert A., 4,611,035, Cl. 525-474.000.
Reylek, Robert S.; and Berg, James G., 4,610,908, Cl. 428-141.000.
Minolta Camera Kabushiki Kaisha: *See*—
Nakamura, Akiyoshi, 4,610,514, Cl. 350-455.000.
Mir, Ghulam N.: *See*—
Yelnosky, John; and Mir, Ghulam N., 4,611,011, Cl. 514-596.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Belt construction for a continuously variable transmission, transverse belt element therefor and methods of making the same. 4,610,648, Cl. 474-242.000.
Mitech Corporation: *See*—
Kleiner, Lothar W., 4,610,808, Cl. 252-512.000.
Mitsubishi Chemical Industries: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,610,804, Cl. 252-299.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Iwata, Toshio, 4,610,232, Cl. 123-425.000.
Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, 4,610,329, Cl. 181-265.000.
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Mitsubishi Gas Chemical Company, Inc.: *See*—
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,610,137, Cl. 60-39.511.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kumagai, Naotake; and Tatemoto, Minoru, 4,610,462, Cl. 280-707.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Kanada, Eiji; Endo, Kazunaka; Yamamoto, Kyonosuke; and Suzuki, Shigeyoshi, 4,610,949, Cl. 430-301.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, 4,610,859, Cl. 423-347.000.
Yamamoto, Takakazu; Yamamoto, Sadaaki; Kobayashi, Sadao; and Sukawa, Hiroshi, 4,610,811, Cl. 252-511.000.
Mitsuyoshi, Takano; and Ando, Mamoru, to Anritsu Electric Company Limited. Spectrum analyzer with automatic peak frequency tuning function. 4,611,164, Cl. 324-77.00B.
Miura, Masakatsu: *See*—
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,336, Cl. 192-4.00A.
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,337, Cl. 192-4.00A.
Miwa, Hirohide: *See*—
Shimura, Takaki; Murakami, Keiichi; Miwa, Hirohide; Sato, Takuso; and Ichida, Nobuyuki, 4,610,255, Cl. 128-660.000.
Miyagawa, Hiroharu; Itoh, Masayoshi; Abe, Tomohiro; Iwata, Kenji; and Koizumi, Kyogo, to Mitsui Toatsu Chemicals, Inc. Process for producing silicon hydrides. 4,610,859, Cl. 423-347.000.
Miyagawa, Masafumi: *See*—
Abe, Masahiro; Miyagawa, Masafumi; Nakamura, Hatsuo; and Yonezawa, Toshio, 4,610,079, Cl. 29-583.000.
Miyai, Akira: *See*—
Yamada, Mitsunori; Ishii, Masaji; Miyai, Akira; Nakajima, Yukihiko; and Sato, Shinsei, 4,610,858, Cl. 423-342.000.
Miyakawa, Eiji, to Miyakawa Industry Co., Ltd. Hole machining device. 4,610,578, Cl. 408-13.000.
Miyakawa Industry Co., Ltd.: *See*—
Miyakawa, Eiji, 4,610,578, Cl. 408-13.000.
Miyake, Haruhisa: *See*—
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Miyamoto, Makoto: *See*—
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Miyamoto, Yosuke; Goto, Hajime; Sato, Hiroshi; Okano, Hiroshi; and Iijima, Masao, to Zeria Shinyaku Kogyo Kabushiki Kaisha. Process for sugar-coating solid preparation. 4,610,891, Cl. 427-3.000.
Miyamura, Masao; Tsukakoshi, Osamu; Kamata, Yoshio; and Aiba, Shoji, to Nihon Shinku Gijutsu Kabushiki Kaisha; and Daido Tokushuko Kaubshiki Kaisha. Magnet apparatus. 4,611,121, Cl. 250-423.00R.
Miyaura, Tatsuya: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.
Miyazaki, Hajime: *See*—
Takiguchi, Takao; Miyazaki, Hajime; Matsumoto, Masakazu; and Ishikawa, Shozo, 4,610,943, Cl. 430-76.000.
Miyazaki, Hideaki; Yamano, Yoshikazu; Saito, Yasunori; Okano, Mikihiko; and Nakano, Tsuneo, to Sumitomo Electric Industries, Ltd. Protective device for overhead wires containing optical fiber units. 4,610,503, Cl. 350-96.200.
Miyazaki, Michio: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; and Miyazaki, Michio, 4,611,314, Cl. 369-32.000.
Miyazawa, Takeshi; Sueshige, Hiroshi; Niikawa, Yutaka; and Shimokawa, Masahide, to Honda Giken Kogyo Kabushiki Kaisha. Control device for clutch and transmission in vehicles. 4,610,335, Cl. 192-3.620.
Miyazawa, Yoshinori: *See*—
Suzuki, Takashi; Matsuzaki, Makoto; Matsuzawa, Masanao; and Miyazawa, Yoshinori, 4,610,554, Cl. 400-124.000.
Mizushina, Youichi, to Denkoh Co., Ltd. Vertical furnace for heat-treating semiconductor. 4,610,628, Cl. 432-241.000.

Mobil Oil Corporation: *See—*
Graven, Richard G., 4,610,778, Cl. 208-89.000.
Kaczerwaski, David J., 4,611,350, Cl. 383-7.000.
Valyocsik, Ernest W.; and Derouane, Eric G., 4,610,855, Cl. 423-328.000.
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Mochizuki, Masatsugu: *See—*
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Mohiuddin, Mahmood, to Hollister Incorporated. Extended film seal for ostomy appliance. 4,610,677, Cl. 604-339.000.

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Schneider, Barry L.; Jensen, Marvin E.; and Mohiuddin, Mahmood, 4,610,676, Cl. 604-339.000.

Mohr, Paul H.: *See—*
Goddard, Errol D.; Leung, Pak S.; and Mohr, Paul H., 4,610,222, Cl. 123-41.420.

Molander, Lance E.; Tiegelmann, Gabriel; and Kirhofer, Walter J., to White Consolidated Industries, Inc. Rotary file locking mechanism. 4,610,492, Cl. 312-305.000.

Molex Incorporated: *See—*
Anderson, Daniel J., 4,610,082, Cl. 29-741.000.

Monaldi, Remo; and Fortibuoni, Raffaello, to Montedison S.p.A. Process for preparing fertilizers releasing nitrogen slowly. 4,610,715, Cl. 71-28.000.

Monarch Marking Systems, Inc.: *See—*
Arnold, Gregory B., 4,610,752, Cl. 156-540.000.
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Duchin, Daniel, 4,610,385, Cl. 227-67.000.

Mondt, Josef: *See—*
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Monier Limited: *See—*
Tomlinson, Robert K., 4,610,545, Cl. 366-2.000.

Monsanto Company: *See—*
Chan, Albert S. C.; and Morris, Donald E., 4,611,082, Cl. 560-204.000.
Seaborn, Douglas K.; and Dowell, William T., 4,610,059, Cl. 28-187.000.

Montague, Herbert R., to Control Concepts Corporation. Apparatus for transforming multiphase power of different phase to phase line levels into multiphase power having a single phase to phase voltage level. 4,611,190, Cl. 336-10.000.

Montedison S.p.A.: *See—*
Monaldi, Remo; and Fortibuoni, Raffaello, 4,610,715, Cl. 71-28.000.

Mooi, John: *See—*
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Moon, Jerald B.: *See—*
Depel, William A.; Weinberg, Bernd; and Moon, Jerald B., 4,610,691, Cl. 623-9.000.

Moore Business Forms, Inc.: *See—*
Lombardo, Leo, 4,610,189, Cl. 83-30.000.

Moore, Danny R.: *See—*
Crenshaw, Susan L. H.; Schlintz, Neal L.; and Moore, Danny R., 4,610,915, Cl. 428-219.000.

Moore, John D.: *See—*
Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,610,311, Cl. 169-45.000.

Moosavian, Seid H., to Firestone Tire & Rubber Company, The. Lactam purification. 4,610,768, Cl. 203-14.000.

Moran, Kevin S.: *See—*
Godkin, Mikhail; and Moran, Kevin S., 4,611,139, Cl. 310-266.000.

Morden, Geoffrey A.: *See—*
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Morello, Aldo: *See—*
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Moretti, Franco: *See—*
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Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., to Physio-Control Corporation. Interactive portable defibrillator. 4,610,254, Cl. 128-419.00D.

Morgan, Howard W.; and Hartog, Ronald L., to Filter Specialists, Inc. Convertible liquid filter. 4,610,787, Cl. 210-239.000.

Morgan, Paul W., to Eaton Corporation. Variable magnetic field coupling circuit and rotary transducer using same. 4,610,168, Cl. 73-862.350.

Mori, Kei. Light by-passing device. 4,610,501, Cl. 350-96.100.

Mori, Masahito: *See—*
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Morimura, Shinji, to Bridgestone Corporation. Floating frame member for use in a fish breeding apparatus. 4,610,219, Cl. 119-3.000.

Morino, Ichiro, to Toshiba Kikai Kabushiki Kaisha. Poppet valve. 4,610,423, Cl. 251-25.000.

Morisawa, Kunio: *See—*
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,336, Cl. 192-4.00A.
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,337, Cl. 192-4.00A.

Morisawa, Tahei; and Aoki, Harumi, to Asahi Kogaku Kogyo K.K. Electronic camera having improved support for optical low-pass filter. 4,611,243, Cl. 358-225.000.

Morita, Terumasa: *See—*
Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, 4,611,221, Cl. 357-30.000.

Moriyama, Noboru: *See—*
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Morris, Charles C.: *See—*
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Morris, Donald E.: *See—*
Chan, Albert S. C.; and Morris, Donald E., 4,611,082, Cl. 560-204.000.

Morrison, Raymond C., to Raytheon Company. Indirectly heated cathode. 4,611,146, Cl. 313-446.000.

Mors: *See—*
Casset, Dominique, 4,610,440, Cl. 269-20.000.

Morse, Charles W.: *See—*
Kubala, Robert; LaPolla, Anthony; Raney, Donald; and Morse, Charles W., 4,610,206, Cl. 104-26.00B.

Mortensen, J. D., to Mehealus Partnership. Fully portable semi-automatic mechanical heart-lung substitution system and method. 4,610,656, Cl. 604-4.000.

Morton, Howard E.: *See—*
Guindon, Yvan; Morton, Howard E.; and Yoakim, Christiane, 4,611,068, Cl. 549-292.000.

Moser, Roland: *See—*
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,611,041, Cl. 526-298.000.

Mosher, Deane F., to Wisconsin Alumni Research Foundation. Monoclonal antibody to thrombospondin and method for assaying for and isolating thrombospondin. 4,610,960, Cl. 435-7.000.

Mosser, Mark F.; and Fabiny, William J., to Sermatech International, Inc. Parts coated with primer coating composition. 4,610,929, Cl. 428-421.000.

Mossey, Paul W., to General Electric Company. Frequency burst analyzer. 4,610,540, Cl. 356-28.500.

Mossman, Allen B., to Amoco Corporation. Catalytic etherification of phenols to alkyl aryl ethers. 4,611,084, Cl. 568-630.000.

Motonami, Masanao: *See—*
Yasumatsu, Jun; Motonami, Masanao; and Yamada, Makoto, 4,610,464, Cl. 280-808.000.

Motor Wheel Corporation: *See—*
Overbeck, Joseph C.; Lawrence, Garth D.; and Golata, John H., 4,610,482, Cl. 301-63.00R.

Motorola, Inc.: *See—*
Engel, James R.; Bruckert, Eugene J.; and Thro, Stuart W., 4,611,334, Cl. 375-100.000.
Godkin, Mikhail; and Moran, Kevin S., 4,611,139, Cl. 310-266.000.
McCallister, Ronald D.; Cochran, Bruce A.; and Bogner, Mary A., 4,611,333, Cl. 375-1.000.
Piosenka, Gerald V.; and Mead, Barry B., 4,611,183, Cl. 331-78.000.
Ziegner, Bernhard A., 4,611,186, Cl. 333-246.000.

Mott, Keith C.: *See—*
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Moulin, Guy: *See—*
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Mourray, Jack W., to Ford Motor Company. Velocity sensitive valve element for a shock absorber. 4,610,332, Cl. 188-322.150.

Mudge, Paul R.; and Katz, Howard G., to National Starch and Chemical Corporation. Binders for nonwovens. 4,610,920, Cl. 428-288.000.

Mueller, Wolfgang: *See—*
Hinsken, Hans; Mayerhoefer, Horst; Mueller, Wolfgang; and Schneider, Hermann, 4,611,016, Cl. 529-99.000.

Mukhometzyanov, Alexandr G.: *See—*
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Mukoh, Akio: *See—*
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Mullen, Charles K., to Hitco. Method and system for producing carbon fibers. 4,610,860, Cl. 423-447.800.

Muller, Bernard L.: *See—*
Schulte-Elte, Karl-Heinrich; Muller, Bernard L.; and Pamingle, Herve , 4,610,813, Cl. 252-522.00R.

Muller, Berthold, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Apparatus for the manufacture of paper containers. 4,610,655, Cl. 493-108.000.

Muller, Ernst-August, to Licentia Patent-Verwaltungs-GmbH. Method for recognizing and sorting articles. 4,610,359, Cl. 209-3.100.

Muller, Horst, to Ciba-Geigy Corporation. Mixtures of organo-tin compounds. 4,611,012, Cl. 521-89.000.

Muller, Jacques: *See—*
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Muller, Kurt: *See—*
Remp, Thomas E.; Dreyfuss, Wilfried; and Muller, Kurt, 4,610,362, Cl. 211-59.400.

Muller, Paul E. Apparatus for picking up plant material lying on the ground. 4,610,130, Cl. 56-370.000.

Muller, Rudolph R. M., to Multifastener Corporation. Method of installing a fastener to a panel. 4,610,072, Cl. 29-512.000.

Muller, Urs: *See*—
Sturm, Elmar; Muller, Urs; and Tobler, Hans, 4,610,716, Cl. 71-76.000.
Mullins, Albert A., II; Stone, Patrick C.; and Ingram, Gary D., to Baker Oil Tools, Inc. Tubing actuated retrievable packer. 4,610,300, Cl. 166-134.000.
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Multifastener Corporation: *See*—
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Mundipharma GmbH: *See*—
Eitenmuller, Jurgen; Rackur, Helmut; Wimmer, Walter; and Weiss, Marija, 4,610,692, Cl. 623-16.000.
Munson, Ronald W.: *See*—
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Murai, Wasaburo; and Yura, Takeshi, to Terasaki Denki Sangyo Kabushiki Kaisha. Circuit breaker. 4,611,188, Cl. 335-16.000.
Murakami, Kanji: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Murakami, Keiichi: *See*—
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Murakami, Toshio: *See*—
Hanma, Kentaro; and Murakami, Toshio, 4,611,244, Cl. 358-227.000.
Murakami, Yoshiteru: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, 4,610,912, Cl. 428-213.000.
Murakawa, Satoshi: *See*—
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Muramatsu, Michihisa: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Tanno, Norihiko; Sato, Hiromi; and Yoshida, Noboru, 4,610,986, Cl. 514-239.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu, 4,610,406, Cl. 242-35.50A.
Noshi, Shinji, 4,610,405, Cl. 242-35.50A.
Murata, Perry L.: *See*—
Harbolt, Bruce; Murata, Perry L.; and Burmaster, Neal C., 4,610,714, Cl. 71-28.000.
Murayama, Seiichi: *See*—
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.
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Miller, Dennis H.; and Mutka, Jerry R., 4,610,890, Cl. 426-651.000.
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Flum, Paul; and Mynatt, Jerry M., 4,610,363, Cl. 211-74.000.
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Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,610,965, Cl. 435-234.000.
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Nagamine, Ryoji: *See*—
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Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,610,644, Cl. 474-82.000.
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Nakajima, Yasuo: *See*—
Shinzawa, Motohiro; and Nakajima, Yasuo, 4,610,138, Cl. 60-286.000.
Nakajima, Yukihiko: *See*—
Yamada, Mitsunori; Ishii, Masaji; Miyai, Akira; Nakajima, Yukihiko; and Sato, Shinsei, 4,610,858, Cl. 423-342.000.
Nakamura, Akira: *See*—
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Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Telephoto lens system. 4,610,514, Cl. 350-455.000.
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Nakamura, Kenji. Dispenser-container containing wet and dry contents and process for manufacturing the same. 4,610,357, Cl. 206-449.000.
Nakamura, Shigeru: *See*—
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Nakamura, Shinya, to Nippon Seiko Kabushiki Kaisha. Bearing mounting device. 4,611,351, Cl. 384-99.000.
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Hayashi, Nobuhiro; Nakahata, Kimio; Tajima, Hatsuo; and Nakamura, Shunji, 4,610,531, Cl. 355-14.00D.
Nakamura, Tsutomu: *See*—
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Nakanishi, Yoichi: *See*—
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Nakano, Keiichi; Umeda, Tatsutoshi; and Tani, Yoshio, to Kubota Limited. Automatic decompression system for starting engine. 4,610,227, Cl. 123-182.000.
Nakano, Shigeki; and Totsuka, Masao, to Canon Kabushiki Kaisha. Signal detection apparatus with plural elongate beams corresponding. 4,611,122, Cl. 250-548.000.
Nakano, Tsuneo: *See*—
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Nakanowatari, Jun, to Alps Electric Co., Ltd. Liquid crystal display device having particular degree of polarization. 4,610,508, Cl. 350-337.000.
Nakata, Hiroaki: *See*—
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Nakata, Hiroshi; and Souma, Houkichi, to Oppama Kogyo Kabushiki Kaisha. Start safety apparatus for internal combustion engine. 4,610,231, Cl. 123-424.000.
Nakayama, Toshikazu. Device for joining frame members for picture frame. 4,610,565, Cl. 403-402.000.
Nakayama, Yoshio; Abe, Fuminori; and Nagasawa, Naofumi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Analog switch circuit and signal attenuator employing an analog switch circuit. 4,611,135, Cl. 307-572.000.
Narasawa, Takashi: *See*—
Ushiro, Tatsuzo; Narasawa, Takashi; Fujiki, Makoto; and Edakubo, Hiroo, 4,611,255, Cl. 360-84.000.
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Bednar, Gregory M.; Fryer, George B.; and Narasimha, Manthri S., 4,611,346, Cl. 382-9.000.
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Narda Microwave Corporation, The: *See*—
Aslan, Edward E., 4,611,166, Cl. 324-95.000.
Nason, Frederic L. Urinanalysis vial. 4,610,171, Cl. 73-864.620.

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Opfer, James E.; and Natarajan, Bangalore R., 4,610,911, Cl. 428-213.000.
Natesh, Ram; and Sellani, Mario A. Method and composition for dissolving deposits of magnetite. 4,610,728, Cl. 134-2.000.
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Murib, Jawad H.; and Kahn, John H., 4,611,069, Cl. 549-326.000.
Speca, Anthony N., 4,610,974, Cl. 502-113.000.
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Natori, Kenji: *See—*
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Naylor, Jimmy R.; and Mietus, David F., to Burr-Brown Corporation. Push-pull output circuit. 4,611,178, Cl. 330-272.000.
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Nebu, Hideaki: *See—*
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NEC Corporation: *See—*
Ando, Manabu, 4,611,134, Cl. 307-482.000.
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Nedorezov, Joseph V., to General Motors Corporation. Method and apparatus for dressing spot welding tips. 4,610,153, Cl. 72-112.000.
Nelson, John A.; and Stout, Gregg W., to Baker Oil Tools, Inc. Redundant firing mechanism for a well perforating gun. 4,610,312, Cl. 175-4.520.
Nelson, John A.: *See—*
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Nelson, Richard B., to Varian Associates, Inc. Beam tube with density plus velocity modulation. 4,611,149, Cl. 315-5.390.
Nelson, Thomas, to Sundstrand Corporation. Turbine compressor stall recovery valve. 4,610,265, Cl. 137-219.000.
Nemeth, Bela J.; and Grab, George P., to Kennametal Inc. Preferentially binder enriched cemented carbide bodies and method of manufacture. 4,610,931, Cl. 428-547.000.
Nesher, Alexander G. HEPA filter with integral separators. 4,610,706, Cl. 55-497.000.
Netravali, Arun N.; and Segen, Jakub, to AT&T Bell Laboratories. Video recognition system. 4,611,347, Cl. 382-27.000.
Neutrogena Corporation: *See—*
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Neveu, Christian D.: *See—*
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New Brunswick Telephone Company Limited, The: *See—*
LeBlanc, Vincent G.; and Cameron, Allan B., 4,611,095, Cl. 179-18.0BC.
New Mexico Institute of Mining and Technology, The: *See—*
Martin, Fred D.; Hatch, Melvin J.; Shepitka, Joel S.; and Donaruma, Lorraine G., 4,610,305, Cl. 166-275.000.
Newdeck, Frank W.: *See—*
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Newsome, David L., to American Can Company. Oriented films of blends of EVOH copolymer. 4,610,914, Cl. 428-216.000.
Newton, H. Gene: *See—*
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NGK Insulators, Ltd.: *See—*
Imanishi, Yuichiro; and Matsui, Minoru, 4,610,967, Cl. 501-103.000.
Mase, Syunzo; and Soejima, Shigeo, 4,610,741, Cl. 156-89.000.
NGK Spark Plug Co., Ltd.: *See—*
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Niagara Mohawk Power Corporation: *See—*
Anderson, John G.; and Stillwell, Howard R., 4,611,207, Cl. 340-870.160.
Nicia, Antonius J. A.; and Khoe, Giok D., to U.S. Philips Corporation. Method of manufacturing a geodetic component and integrated optical device comprising said component. 4,610,502, Cl. 350-96.120.
Nicia, Antonius J. A.: *See—*
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Nickel, Hans: *See—*
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Nicoloff, Demetre M.: *See—*
Possis, Zinon C.; and Nicoloff, Demetre M., 4,610,661, Cl. 604-52.000.
Niedermayr, Erich, to Siemens Aktiengesellschaft. Manipulation device such as an industrial robot having at least one sensor. 4,611,296, Cl. 364-513.000.
Nienaber, David K., to Zenith Electronics Corporation. Vertical video centering control system. 4,611,230, Cl. 358-158.000.
Nifco Inc.: *See—*
Hara, Kunio, 4,610,067, Cl. 29-33.500.
Nihei, Kazuhiro, to Casio Computer Co., Ltd. Handy reader/printer apparatus. 4,611,246, Cl. 358-256.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Miyamura, Masao; Tsukakoshi, Osamu; Kamata, Yoshio; and Aiba, Shoji, 4,611,121, Cl. 250-423.00R.
Nihon Technical Kabushiki Kaisha: *See—*
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Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Vikior I., to Kalininsky Politekhnichesky Institut USSR. Apparatus for producing fibrides of synthetic heterochain polymers. 4,610,850, Cl. 422-131.000.
Nikitina, Tatyana I.: *See—*
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Nippon Electric Co., Ltd.: *See—*
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Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nippon Kogaku K. K.: *See—*
Fukino, Kunihiro; and Kotaka, Yoshiro, 4,610,517, Cl. 350-580.000.
Tanimoto, Akikazu; and Imamura, Kazunori, 4,610,541, Cl. 356-237.000.
Nippon Kogaku K.K.: *See—*
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Nippon Light Metal Co., Ltd.: *See—*
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Nippon Seiki Kabushiki Kaisha: *See—*
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Nippon Seiko Kabushiki Kaisha: *See—*
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.
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Nippon Soda Co., Ltd.: *See—*
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Nippon Soken, Inc.: *See—*
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Natsuyama, Yukihiro, 4,610,427, Cl. 251-129.060.
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, 4,610,480, Cl. 297-478.000.
Nippon Thompson Co., Ltd.: *See—*
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Nishibori, Sadao. Wood-like molded product of synthetic resin. 4,610,900, Cl. 428-15.000.
Nishikawa, Yasuhisa: *See—*
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Kikuchi, Haruhiko, 4,610,828, Cl. 260-501.130.
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Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,610,984, Cl. 514-235.000.
Niwa, Shigeo; Sugishita, Junji; and Ishii, Masami, to Aisin Seiki Kabushiki Kaisha. Implanting article molded by centrifugal dispersion and the method for producing the same. 4,610,693, Cl. 623-16.000.
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Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., 4,610,753, Cl. 156-552.000.
Nobumoto, Kazutoshi; and Sumida, Shizuo, to Mazda Motor Corporation. Control of a steplessly variable vehicle transmission. 4,610,183, Cl. 74-866.000.
Noca, Joseph A.: *See*—
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Noguchi, Toshiaki: *See*—
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Nogueira, Eduardo D.; and Redondo Abad, Angel L. Process for leaching sulphide concentrates of the tetrahedrite type containing high concentrations of arsenic and antimony. 4,610,723, Cl. 75-101.00R.
Nohren, Hubert: *See*—
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Nomura, Masaaki; Nahara, Akira; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magneto-optical disk memory. 4,610,903, Cl. 428-64.000.
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Nordstrom, Urban. Method for joining insulated conduits. 4,610,740, Cl. 156-79.000.
Norman, Arthur E., to Torr Vacuum Products, Inc. Protective control system for diffusion pump. 4,610,603, Cl. 417-154.000.
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Norris, Robert D.; Brown, Richard A.; and Brubaker, Gaylen R., to FMC Corporation. Peroxygen breaker systems for well completion fluids. 4,610,795, Cl. 252-8.551.
North American Philips Corporation: *See*—
Stolfi, Fred R.; and Shapiro, Paul J., 4,610,143, Cl. 62-6.000.
Northwest Podiatric Laboratories, Inc.: *See*—
Brown, Dennis N., 4,610,101, Cl. 36-44.000.
Norton Company: *See*—
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Noshi, Shinji, to Murata Kikai Kabushiki Kaisha. Take-up tube supply system in winder. 4,610,405, Cl. 242-35.50A.
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Novak, Richard C.: *See*—
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Nowak, David, to RCA Corporation. Self-propelled vehicle power train evaluation. 4,610,159, Cl. 73-116.000.
Nowotarski, Mark S., to Union Carbide Corporation. Process for wave soldering. 4,610,391, Cl. 228-219.000.
Nozawa, Hiroshi: *See*—
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Nukem GmbH: *See*—
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Nussbaum, Samuel E., to Honeywell Inc. Pulse RF frequency measurement apparatus. 4,611,165, Cl. 324-77.00B.
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Nyby Uddeholm Powder AB: *See*—
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Nypro Inc.: *See*—
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Obara, Hideo: *See*—
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Obayashi, Hiroaki: *See*—
Kobayashi, Hiroshi; and Obayashi, Hiroaki, 4,611,287, Cl. 364-442.000.
Oberlinner, Andreas, to BASF Aktiengesellschaft. Spirodibenzopyrans. 4,611,070, Cl. 549-344.000.
O'Brien, John T.; Goff, Donald D.; and Hoover, Gary M., to Phillips Petroleum Company. Downhole tool. 4,610,309, Cl. 166-382.000.
Odahara, Tetsuichi: *See*—
Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, 4,610,127, Cl. 56-14.600.
Ogata, Mikito; Mori, Masahito; Doi, Takashi; and Miyazaki, Michio, to Hitachi, Ltd. Method for accessing to a rotating record medium and an access control system. 4,611,314, Cl. 369-32.000.
Ogawa, Masahiro; and Abe, Susumu, to Toyota Jidosha Kabushiki Kaisha. Method for making ultra-fine ceramic particles. 4,610,857, Cl. 423-335.000.
Ogino, Yasuo, to Canon Kabushiki Kaisha. Optical disk apparatus and track access method therefor. 4,611,315, Cl. 369-33.000.
Ogishi, Hidetsugu: *See*—
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.
Ogura, Mitsugi: *See*—
Ohuchi, Kazunori; Ogura, Mitsugi; and Natori, Kenji, 4,611,237, Cl. 357-71.000.
Ohara, Yoshio; Arai, Kazutaka; Takahashi, Yasuhiro; and Takakuwa, Yasuo, to Nissan Chemical Industries, Ltd. Process for preparing D-α-(6-methoxy-2-naphtyl) propionic acid. 4,611,088, Cl. 562-466.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Push-button tuner. 4,610,173, Cl. 74-10.330.
Ohgishi, Hideo: *See*—
Sekiguchi, Hisashi; Kobayashi, Norio; and Ohgishi, Hideo, 4,611,036, Cl. 525-481.000.
Ohira, Keiichi: *See*—
Hamada, Akira; Funakoshi, Akira; and Ohira, Keiichi, 4,611,141, Cl. 310-334.000.
Ohnishi, Kazuhiko; and Hayashi, Masaaki, to Glory Kogyo Kabushiki Kaisha. Bank bill identification device. 4,611,345, Cl. 382-7.000.
Ohshima, Ken: *See*—
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,316, Cl. 369-44.000.
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,317, Cl. 369-45.000.
Ohta, Kenji: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, 4,610,912, Cl. 428-213.000.
Ohta, Yoshio; Kimura, Tadashi; Ijichi, Kiyoteru; and Takizawa, Masaaki, to Toyota Jidosha Kabushiki Kaisha. Mounting construction for engine-transmission assembly. 4,610,421, Cl. 248-550.000.
Ohuchi, Kazunori; Ogura, Mitsugi; and Natori, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,611,237, Cl. 357-71.000.
Okabayashi, Makoto; and Haruta, Masao, to Osaka Gas Company. Fluidic flowmeter. 4,610,162, Cl. 73-197.000.
Okada, Ryoji: *See*—
Araya, Takeshi; Okada, Ryoji; Ibaraki, Yoshiro; Hioki, Susumu; Kanamaru, Masatoshi; Endo, Yoshishige; and Haneda, Mitsuaki, 4,610,718, Cl. 75-0.50C.
Okano, Hiroshi: *See*—
Miyamoto, Yosuke; Goto, Hajime; Sato, Hiroshi; Okano, Hiroshi; and Iijima, Masao, 4,610,891, Cl. 427-3.000.
Okano, Mikihiko: *See*—
Miyazaki, Hideaki; Yamano, Yoshikazu; Saito, Yasunori; Okano, Mikihiko; and Nakano, Tsuneo, 4,610,503, Cl. 350-96.200.
Okazaki, Kiyoshi, to Kabushiki Kaisha Toshiba. Apparatus for examining a biological object by using radiation. 4,611,340, Cl. 378-95.000.
Oki Electric Industry Co., Ltd.: *See*—
Shosaku, Tsukagoshi, 4,611,195, Cl. 340-347.0DA.
Okino, Yoshinori, to Mazda Motor Corporation. Fuel supply control for a dual induction type engine intake system. 4,610,236, Cl. 123-585.000.
Oku, Kenichi; and Suzuki, Masaki, to Matsushita Electric Industrial Co, Ltd. Positioning table. 4,610,442, Cl. 269-73.000.
Okubo, Eiji: *See*—
Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, 4,611,335, Cl. 375-110.000.
Okuma, Takeshi. Combustion device of an internal combustion engine. 4,610,226, Cl. 123-143.00A.
Olin Corporation: *See*—
Halverson, Henry J., 4,610,061, Cl. 29-1.230.
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,610,993, Cl. 514-335.000.
Ollivier, Jean; and Almeras, Roland, to Illinois Tool Works Inc. Disk magazine with anti-stress holes. 4,610,382, Cl. 227-9.000.
Olschewski, Armin: *See*—
Walter, Lothar; Brandenstein, Manfred; and Olschewski, Armin, 4,610,646, Cl. 474-198.000.
Olsen, Alden W.: *See*—
Johnson, Steven W.; and Olsen, Aiden W., 4,610,218, Cl. 118-303.000.
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Emulsion and dispersion comprising cross-linked polymeric microgel prepared from polymerizing epoxy-containing monomer in the presence of an acid. 4,611,026, Cl. 524-548.000.
Olson, Kurt G.; Blackburn, William P.; and Endlish, Mark E., to PPG Industries, Inc. Fluoride ion as a curing catalyst for silicon-containing resins. 4,611,040, Cl. 526-279.000.

Olympus Optical Co., Ltd.: *See—*
Hattori, Shinichiro; Hosoda, Seiichi; Kanno, Masahide; and Amano, Atsushi, 4,611,271, Cl. 364-184.000.
Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, 4,611,221, Cl. 357-30.000.
Inoue, Akira, 4,610,521, Cl. 354-145.100.
Nishioka, Kimihiko; and Yamashita, Nobuo, 4,610,513, Cl. 350-442.000.
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,316, Cl. 369-44.000.
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,611,317, Cl. 369-45.000.
Yokota, Akira, 4,610,516, Cl. 350-475.000.

Ondetti, Miguel A., to E. R. Squibb and Sons, Inc. Carboxymethyl esters of mercaptopropanoic acids as enkephalinase inhibitors. 4,611,002, Cl. 514-419.000.

Onitsuka, Osamu: *See—*
Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, 4,611,221, Cl. 357-30.000.

Ono, Hiroshi: *See—*
Kuramoto, Tohru; Miki, Toshiharu; Nishino, Kozo; and Ono, Hiroshi, 4,610,864, Cl. 423-344.000.

Ono, Shigetoshi; Nakamura, Shigeru; and Matsumoto, Kazuhiko, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic materials. 4,610,959, Cl. 430-598.000.

Ono, Tetsuo: *See—*
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.

Onoda, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Pen-recording apparatus with multi-station pen-holding head. 4,611,215, Cl. 346-49.000.

Ootani, Shoji: *See—*
Yamashita, Osamu; Moriyama, Noboru; Ootani, Shoji; and Wasamoto, Katsuyo, 4,611,087, Cl. 560-81.000.

Opfer, James E.; and Natarajan, Bangalore R., to Hewlett-Packard Company. Thin film magnetic recording media. 4,610,911, Cl. 428-213.000.

Opower, Hans: *See—*
Ernst, Volker; and Opower, Hans, 4,611,329, Cl. 372-88.000.

Oppama Kogyo Kabushiki Kaisha: *See—*
Nakata, Hiroshi; and Souma, Houkichi, 4,610,231, Cl. 123-424.000.

Orain, Michel A., to Glaenzer Spicer. Double-joint transmission device in particular for a vehicle. 4,610,327, Cl. 180-73.100.

Orshansky Transmission Corporation: *See—*
Beck, Niels J.; Gilbert, Edward T.; Weseloh, William E.; and Rudolph, Kenneth, 4,610,267, Cl. 137-329.300.

Ortiz, Jose A.: *See—*
Foguet, Rafael; Forne, Ernesto; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,610,998, Cl. 514-399.000.

Osaka Gas Company: *See—*
Okabayashi, Makoto; and Haruta, Masao, 4,610,162, Cl. 73-197.000.

Osborne, Edward W. Electric boat motor. 4,610,632, Cl. 440-6.000.

Osburg, Dieter: *See—*
Voss, Peter; and Osburg, Dieter, 4,610,593, Cl. 414-43.000.

Ostergaard, Steen. Dowel for assembling furniture parts. 4,610,563, Cl. 403-295.000.

Osterholm, Jan-Erik: *See—*
Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, 4,610,809, Cl. 252-500.000.

Otokuni, Tadaaki: *See—*
Kubota, Hitoshi; Otokuni, Tadaaki; Suzuki, Shoji; and Nakagawa, Keiji, 4,610,338, Cl. 192-13.00A.

Otomo, Shigekazu: *See—*
Kumasaka, Noriyuki; Fujiwara, Hideo; Saito, Noritoshi; Otomo, Shigekazu; Yamashita, Takeo; and Kudo, Mitsuhiro, 4,610,935, Cl. 428-632.000.

O'Toole, Francis S.: *See—*
Bacon, William H.; and O'Toole, Francis S., 4,610,737, Cl. 156-49.000.

Otto, Johann: *See—*
Fazekas, Peter; and Otto, Johann, 4,611,119, Cl. 250-307.000.

Overbeck, Joseph C.; Lawrence, Garth D.; and Golata, John H., to Motor Wheel Corporation. Vehicle wheel with disc forming outer tire retaining flange. 4,610,482, Cl. 301-63.00R.

Owens-Illinois, Inc.: *See—*
Estes, Ann E.; and Staczek, Donald J., 4,610,366, Cl. 215-1.00C.
Ringlien, James A., 4,610,542, Cl. 356-240.000.
Swartzbaugh, Peter T., 4,610,372, Cl. 220-288.000.

Oy Fiskars Ab Veneveistamo: *See—*
Jaatinen, Jari, 4,610,474, Cl. 294-82.270.

Oyamada, Takeshi: *See—*
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.

Ozawa, Tetsuo: *See—*
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,610,804, Cl. 252-299.100.

PA Incorporated: *See—*
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,611,170, Cl. 324-229.000.

Pace, Ray S.: *See—*
Reese, Dyke W.; Pace, Ray S.; and McKenzie, Lee F., 4,610,306, Cl. 166-293.000.

Pacific Bell: *See—*
Schembri, John J., 4,611,100, Cl. 179-175.30F.

Page, Derrick J., to Westinghouse Electric Corp. Solid-state switch. 4,611,222, Cl. 357-30.000.

Palaniswamy, Pachagounder: *See—*
Underhill. Edward W.; Wong, John W.; Palaniswamy, Pachagounder; Steck, Warren F.; and Chisholm, Melvin D., 4,610,876, Cl. 424-84.000.

Palazzolo, Peter G. Cheese shredding machine and blade therefor. 4,610,398, Cl. 241-92.000.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Drill feed handle. 4,610,580, Cl. 408-136.000.

Palmquist, Ronald W.; and Thomas, Robert R., to Corning Glass Works. Glass melting furnace. 4,611,331, Cl. 373-30.000.

Palnik, Karl, to Carolinch Company, The. Electrolytic plating apparatus. 4,610,772, Cl. 204-206.000.

Pamingle, Herve : *See—*
Schulte-Elte, Karl-Heinrich; Muller, Bernard L.; and Pamingle, Herve , 4,610,813, Cl. 252-522.00R.

Panoz, Donald E.; and Corrigan, Owen I., to Elan Corporation, P.L.C. Medicaments with a high degree of solubility and method for their production. 4,610,875, Cl. 424-80.000.

Pant, Paul: *See—*
Hartwig, Jurgen; and Pant, Paul, 4,610,734, Cl. 148-120.000.

Pap Szekeres, Jozsef: *See—*
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Papanicolaou, Nicolas A.: *See—*
Whitlock, Robert R.; and Papanicolaou, Nicolas A., 4,611,140, Cl. 310-313.00B.

Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro Inc. Directional flow control. 4,610,276, Cl. 137-856.000.

Pardini, Franco P.; and Banfi, Claudio, to General Electric Company. Circuit breaker contact structure. 4,611,106, Cl. 200-147.00R.

Park, Lester D.: *See—*
Kramer, Francis J.; Park, Lester D.; and Massari, Donald J., Jr., 4,610,381, Cl. 227-7.000.

Parker, Francis F., to Adams, Peter D., a part interest. Manual shift control lever device and self-contained electronic control for transmissions. 4,610,179, Cl. 74-335.000.

Pask, Stephen D.: *See—*
Musch, Rudiger; Nuyken, Oskar; Pask, Stephen D.; Vischer, Axel; and Walter, Michael, 4,611,037, Cl. 526-135.000.

Pastor, Stephen D.: *See—*
Spivak, John D.; and Pastor, Stephen D., 4,611,023, Cl. 524-326.000.

Pastusek, Paul E.: *See—*
Daly, Jeffery E.; and Pastusek, Paul E., 4,610,313, Cl. 175-40.000.

Patalong, Hubert, to Siemens Aktiengesellschaft. Triac having a multilayer semiconductor body. 4,611,128, Cl. 307-252.00B.

Pateman, Antony F.: *See—*
Brooks, Graham L.; Pateman, Antony F.; Thomson, Michael A.; and Scott, John, 4,610,282, Cl. 141-46.000.

Patterson, Gregory A.; and Good, Melvin S., to Amoco Corporation. Pressure release vent. 4,610,370, Cl. 220-207.000.

Paul Flum Ideas, Inc.: *See—*
Flum, Paul; and Mynatt, Jerry M., 4,610,363, Cl. 211-74.000.

Paul Hartmann Aktiengesellschaft: *See—*
Eschler, Dieter, 4,610,751, Cl. 156-517.000.

Paulsen, Gustav. Paper coloring apparatus. 4,610,216, Cl. 118-46.000.

Paurat, Friedrich W.; and Paurat, Roland. Tunneling machine. 4,610,573, Cl. 405-259.000.

Paurat, Roland: *See—*
Paurat, Friedrich W.; and Paurat, Roland, 4,610,573, Cl. 405-259.000.

Paxall Group, Inc., The: *See—*
Chenoweth, David A.; and Davis, Thornton R., Jr., 4,610,323, Cl. 177-25.000.

Payne, John W.: *See—*
Lewis, Robert T.; Dwyer, George F., Jr.; and Payne, John W., 4,610,432, Cl. 256-65.000.

PCL Packaging Limited: *See—*
Piggott, David C., 4,610,650, Cl. 493-204.000.

Peach, Roy W.; Kahn, William M.; and Shapiro, David, to Hewlett-Packard Company. Function analyzing. 4,611,307, Cl. 364-900.000.

Pearsall, Floyd A.: *See—*
Bouldin, Floyd E.; Bouldin, E. Lloyd; Cantrell, Thomas E.; and Pearsall, Floyd A., 4,610,596, Cl. 414-412.000.

Pearson, Albert M.; Brooks, Roger I.; Hogberg, Maynard G.; Pestka, James J.; and Gray, J. Ian, to Research Corporation. Immunological prevention of boar odor in uncastrated male pigs. 4,610,877, Cl. 424-88.000.

Pearson, James A., to Swinney Engineering Limited. Filter cage with removable filters. 4,610,786, Cl. 210-236.000.

Pearson, Phil E., Jr.: *See—*
Williams, Eugene C.; and Pearson, Phil E., Jr., 4,611,348, Cl. 382-44.000.

Peavey Electronics Corp.: *See—*
Taylor, Wilson E., Jr.; and Hand, Larry E., 4,611,300, Cl. 365-194.000.

Pedersen, Gerald D., to Cannon Equipment Company. Pegbar display device. 4,610,413, Cl. 248-220.300.

Pederson, William K., Jr.; and Tils, John J., to Tektronix, Inc. Surface mount package for toroids. 4,611,092, Cl. 174-52.0PE.

Pedicano, Ernest: *See—*
Pedicano, James J.; Kane, James G.; and Pedicano, Ernest, 4,610,667, Cl. 604-192.000.

Pedicano, James J.; Kane, James G.; and Pedicano, Ernest. Disposable safety needle sheath. 4,610,667, Cl. 604-192.000.

Pelavin, Joseph Y. Luggage frame with flexible reinforcement spring. 4,610,334, Cl. 190-122.000.

Pelletier, Robert: *See—*
Brun, Claude; Cheux, Auguste; and Pelletier, Robert, 4,611,038, Cl. 526-169.200.

Peltonen, Kauko: *See—*
Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, 4,610,761, Cl. 162-157.600.

PEMCO Inc.: *See—*
Meives, Otis E.; and Lutzke, Anthony, 4,610,125, Cl. 53-462.000.

Peng, Stephen C.; and Nordstrom, John D., to Ford Motor Company. Polymeric dispersion stabilizer and stable dispersions prepared therefrom. 4,611,028, Cl. 524-850.000.

Pennsylvania Engineering Corporation: *See—*
Saitoh, Kazunori, 4,611,339, Cl. 373-80.000.

Perovich, Paul C., to Comet Research, Inc. Method for treating a single side of a metallic sheet. 4,610,389, Cl. 228-176.000.

Peroxid-Chemie GmbH: *See—*
Reh, Wolfgang; and Schelle, Siegfried, 4,610,865, Cl. 423-513.000.

Perri, Joseph A.: *See—*
LaBate, Michael D., II; and Perri, Joseph A., 4,610,436, Cl. 266-272.000.

Perrine, Neill D.; and Fournier, Paul J. E., to Aeroquip Corporation. Conduit coupling. 4,610,470, Cl. 285-321.000.

Pestka, James J.: *See—*
Pearson, Albert M.; Brooks, Roger I.; Hogberg, Maynard G.; Pestka, James J.; and Gray, J. Ian, 4,610,877, Cl. 424-88.000.

Peters, Edward N., to General Electric Company. Hydroxy terminated polyetherimide oligomers. 4,611,048, Cl. 528-185.000.

Peters, Edwin F., to Amoco Corporation. Catalyst feeding system. 4,610,574, Cl. 406-50.000.

Peters, Fredus N., III: *See—*
Kindig, Alan L.; and Peters, Fredus N., III, 4,611,138, Cl. 310-71.000.

Peterson, Benjamin C.; Linde, Yoseph L.; and Brandman, Yigal, to Codex Corporation. High speed fully precharged programmable logic array. 4,611,133, Cl. 307-465.000.

Petit, Jocelyn I.: *See—*
Sanders, Robert E., Jr.; and Petit, Jocelyn I., 4,610,733, Cl. 148-12.70A.

Petrovich, Enrique G. Fast self righting catamaran. 4,610,212, Cl. 114-39.000.

Pettit, George R.; Herald, Cherry L.; and Kamano, Yoskiaki, to Arizona State University. Bryostatins. 4,611,066, Cl. 549-267.000.

Pfau, Hans; and Fleiter, Albert, to Ipsen Industries International GmbH. Industrial furnace for the thermal treatment of metal workpieces. 4,610,435, Cl. 266-250.000.

PFD Limited: *See—*
Langford, Edward A.; Neale, Reginald L.; and Morden, Geoffrey A., 4,610,155, Cl. 72-353.000.

Pfizer Hospital Products Group, Inc.: *See—*
Silvestrini, Thomas A.; and Laptewicz, Joseph E., Jr., 4,610,688, Cl. 623-1.000.

Pfizer Inc.: *See—*
Lombardino, Joseph G., 4,610,982, Cl. 514-225.000.

Phelps Dodge Industries, Inc.: *See—*
Barta, Donald J.; and Sollner, George H., 4,611,050, Cl. 528-289.000.

Phifer, Clarence G., to Westinghouse Electric Corp. Method and apparatus for clearing short-circuited, high-voltage cathodes in a sputtering chamber. 4,610,775, Cl. 204-298.000.

Philips Industrial Components, Inc.: *See—*
Van Becelaere, Robert M., 4,610,197, Cl. 98-110.000.

Philips Kommunikations Industrie AG: *See—*
Hessenmuller, Horst, 4,611,323, Cl. 370-79.000.

Phillips, Bobby M.; and Duncan, Bobby D., to Eastman Kodak Company. Drafting system for yarns. 4,610,060, Cl. 28-246.000.

Phillips Petroleum Company: *See—*
Clark, J. Bennett, 4,610,302, Cl. 166-246.000.
Kolts, John H.; Figard, Joseph E.; Kimble, James B.; and Kubicek, Donald H., 4,610,766, Cl. 204-157.520.
O'Brien, John T.; Goff, Donald D.; and Hoover, Gary M., 4,610,309, Cl. 166-382.000.
Wolfe, Al R., 4,611,024, Cl. 524-366.000.

Phillips Plastics Corporation: *See—*
Wollar, Burnell J.; and Schwind, Richard J., 4,610,587, Cl. 411-60.000.

Phillipson, John G., to Baker Perkins Holdings PLC. Devices for separating contiguous articles. 4,610,346, Cl. 198-425.000.

Phoenix Simpton Company: *See—*
Albang, Nicholas P.; Lindsay, Gary L.; and Foster, Daniel F., 4,610,566, Cl. 404-4.000.

Physio-Control Corporation: *See—*
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,610,254, Cl. 128-419.00D.

Piazza, Pietro, to Coleco Industries, Inc. Simulated flying creature with flappable wings. 4,610,639, Cl. 446-327.000.

Piazza, Pietro: *See—*
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,610,640, Cl. 446-329.000.

Pienta, David J., to Automatic Handling & Fabrication, Inc. Robotic downender apparatus. 4,610,592, Cl. 414-38.000.

Piggott, David C., to PCL Packaging Limited. Plastic bag handle forming apparatus. 4,610,650, Cl. 493-204.000.

Pigna, Daniele P., to Rilecart S.p.A. Automatic punching and wire comb binding machine. 4,610,590, Cl. 412-11.000.

Pione, Anthony E., to International Business Machines Corporation. Synchronized microsequencer for a microprocessor. 4,611,273, Cl. 364-200.000.

Pioneer Electronic Corporation: *See—*
Fujie, Norikazu, 4,611,136, Cl. 307-603.000.
Hayama, Akira; and Suzuki, Shinichi, 4,611,344, Cl. 381-108.000.
Kamei, Kazuo; and Iida, Toshiharu, 4,611,253, Cl. 360-66.000.
Naito, Ryuichi, 4,611,319, Cl. 369-47.000.

Piosenka, Gerald V.; and Mead, Barry B., to Motorola, Inc. Digital decorrelating random data generator. 4,611,183, Cl. 331-78.000.

Pitney Bowes Inc.: *See—*
Dudley, Catherine M.; and Remedios, Thomas A., 4,611,297, Cl. 364-900.000.
McFiggans, Robert B., 4,611,282, Cl. 364-406.000.

Pizzino, Joanne L. Dual syringe. 4,610,666, Cl. 604-191.000.

Plakunov, James: *See—*
Chen, Janglin; Kelly, James E.; and Plakunov, James, 4,610,955, Cl. 430-527.000.

Platt, Ronald: *See—*
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,611,062, Cl. 548-309.000.

PLK Papier-und Kunstoff Werk Linnich GmbH: *See—*
Friess, Hans, 4,610,649, Cl. 493-11.000.

Plumb, Edwin W., to Pressmate, Inc. Stagger feeder. 4,610,380, Cl. 226-142.000.

Plummer, William T.: *See—*
Smyth, William K.; Chen, Richard J.; and Plummer, William T., 4,610,536, Cl. 355-38.000.

PMC Industries: *See—*
Spreen, George E.; Herold, Hans; and Wysocki, Kazmier, 4,610,345, Cl. 198-392.000.

Polaroid Corporation: *See—*
Smyth, William K.; Chen, Richard J.; and Plummer, William T., 4,610,536, Cl. 355-38.000.

Pols, Pieter M., to Machinefabriek A. Fontijne B.V. Hydraulic press for compacting drums containing radio-active waste. 4,610,199, Cl. 100-269.00R.

Popescu, Mircea C.: *See—*
Fountain, Michael W.; Weiss, Steven J.; Kearns, John J.; Weiner, Alan L.; and Popescu, Mircea C., 4,610,868, Cl. 424-1.100.

Porcher, Thomas C.: *See—*
DiNitto, Robert S.; Porcher, Thomas C.; and Eng, John W., 4,611,202, Cl. 340-724.000.

Porter, Stanley P.; Williams, John H.; and Avery, William W., to Fraser Firs For Christmas. Christmas tree packaging systems and stands. 4,610,356, Cl. 206-423.000.

Possis Medical, Incorporated: *See—*
Possis, Zinon C.; and Nicoloff, Demetre M., 4,610,661, Cl. 604-52.000.

Possis, Zinon C.; and Nicoloff, Demetre M., to Possis Medical, Incorporated. Perfusion device. 4,610,661, Cl. 604-52.000.

Potemski, Andrew S.: *See—*
Andresen, Mark E.; Kriz, Thomas A.; and Potemski, Andrew S., 4,611,279, Cl. 364-200.000.

Potter, Richard R.: *See—*
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., 4,611,091, Cl. 136-260.000.

Potters Industries, Inc.: *See—*
Fuchs, Alfred E., 4,610,966, Cl. 436-2.000.

Pouzoulet, Claude, to Quinette International S.A. Chair with raisable seat, particularly for theaters. 4,610,479, Cl. 297-332.000.

Powell, James C.; and Allan, G. Graham, to Precision-Cosmet Co., Inc. Wettable, gas permeable contact lens. 4,611,039, Cl. 526-271.000.

Powell, Joseph F., III: *See—*
Farmer, Donald J.; and Powell, Joseph F., III, 4,611,093, Cl. 174-152.00R.

Powers, Kerns H., to RCA Corporation. Progressive scan HDTV system. 4,611,225, Cl. 358-140.000.

PPG Industries, Inc.: *See—*
Barch, Herbert W., 4,610,789, Cl. 210-321.400.
Bosso, Joseph F.; and Geiger, William J., 4,610,769, Cl. 204-181.700.
Frank, Robert G.; Noca, Joseph A.; Kelly, Joseph B.; and Bowers, Robert L., 4,610,579, Cl. 408-60.000.
Gillery, F. Howard, 4,610,771, Cl. 204-192.100.
Grundy, Reed H., 4,610,707, Cl. 65-2.000.
Koontz, Harry S., 4,610,710, Cl. 65-29.000.
Matesa, Joseph M.; Won, Kwang J.; and Demarest, Henry M., Jr., 4,610,711, Cl. 65-134.000.
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,611,026, Cl. 524-548.000.
Olson, Kurt G.; Blackburn, William P.; and Endlish, Mark E., 4,611,040, Cl. 526-279.000.
Thompson, Albert E., Jr., 4,610,115, Cl. 52-171.000.

Precision-Cosmet Co., Inc.: *See—*
Powell, James C.; and Allan, G. Graham, 4,611,039, Cl. 526-271.000.
Premium Allied Tool, Inc.: *See—*
Kamuf, Jerry A.; and Arnold, Russell L., 4,611,145, Cl. 313-446.000.
Pressmate, Inc.: *See—*
Plumb, Edwin W., 4,610,380, Cl. 226-142.000.
Prevorsek, Dusan C.: *See—*
Akkapeddi, Murali K.; DeBona, Bruce T.; Li, Hsin L.; and Prevorsek, Dusan C., 4,611,025, Cl. 524-449.000.
Procter & Gamble Company, The: *See—*
Crenshaw, Susan L. H.; Schlintz, Neal L.; and Moore, Danny R., 4,610,915, Cl. 428-219.000.
Lewis, Robert B., III; and Prosise, Robert L., 4,610,884, Cl. 426-103.000.
Proctor & Schwartz, Inc.: *See—*
Van Camp, John; and Baran, Stanley J., 4,610,849, Cl. 422-111.000.
Product Research and Development: *See—*
Hartley, E. Dale; and Hartley, F. Scott, 4,610,192, Cl. 91-341.00R.
Hartley, E. Dale, 4,610,605, Cl. 417-269.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Lalu, Jean-Pierre; and Foulletier, Louis, 4,610,829, Cl. 260-543.00R.
Progressive Assembly Machine Co., Inc.: *See—*
Rasmussen, Robert, 4,610,377, Cl. 222-288.000.
Progressive Machine Products, Inc.: *See—*
Betush, Frank A., 4,610,630, Cl. 433-79.000.
Proprietary Technology: *See—*
Bartholomew, Donald D., 4,610,284, Cl. 141-302.000.
Prosise, Robert L.: *See—*
Lewis, Robert B., III; and Prosise, Robert L., 4,610,884, Cl. 426-103.000.
Protectaire Systems Co.: *See—*
Russell, Frederick E., 4,610,785, Cl. 210-195.100.
PTX-Pentronix, Inc.: *See—*
DeSantis, Raymond P., 4,610,126, Cl. 53-475.000.
Puchta, Rolf: *See—*
Wilsberg, Heinz-Manfred; Puchta, Rolf; Koester, Klaus; and Carduck, Franz-Josef, 4,610,799, Cl. 252-90.000.
Pulyer, Yuly M.: *See—*
Mickle, Marlin H.; and Pulyer, Yuly M., 4,610,172, Cl. 74-5.460.
Purdue Research Foundation: *See—*
Depel, William A.; Weinberg, Bernd; and Moon, Jerald B., 4,610,691, Cl. 623-9.000.
Quantle Limited: *See—*
Searby, Anthony D., 4,611,232, Cl. 358-160.000.
Queen's University at Kingston: *See—*
Giles, Alan R.; and Mann, Kenneth G., 4,610,880, Cl. 424-101.000.
Questek Incorporated: *See—*
Klauminzer, Gary K.; Merz, S. Spencer; and Campbell, James D., 4,611,270, Cl. 364-183.000.
Quinette International S.A.: *See—*
Pouzoulet, Claude, 4,610,479, Cl. 297-332.000.
Quinnell, John O. Method and apparatus for igniting flare gas. 4,610,622, Cl. 431-5.000.
Rabinovich, Vikior I.: *See—*
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Vikior I., 4,610,850, Cl. 422-131.000.
Racal Data Communications Inc.: *See—*
Miller, William J.; Chiu, Ran F.; Joerger, Richard B.; and Newdeck, Frank W., 4,611,342, Cl. 381-36.000.
Race-Rail, Inc.: *See—*
Lewis, Robert T.; Dwyer, George F., Jr.; and Payne, John W., 4,610,432, Cl. 256-65.000.
Rach, Heinz-Dieter; Frerichs, Udo; Klose, Hans-Ulrich; and Boltze, Carsten, to Continental Gummi-Werke Aktiengesellschaft. Method and apparatus for demounting pneumatic vehicle tires. 4,610,287, Cl. 157-1.170.
Rach, Heinz-Dieter: *See—*
Huinink, Heinrich; Seitz, Hans; Rach, Heinz-Dieter; and Frerichs, Udo, 4,610,288, Cl. 157-1.220.
Rackur, Helmut: *See—*
Eitenmuller, Jurgen; Rackur, Helmut; Wimmer, Walter; and Weiss, Marija, 4,610,692, Cl. 623-16.000.
Racky, Berthold: *See—*
Geier, Rolf; and Racky, Berthold, 4,610,839, Cl. 376-272.000.
Ragazzoni, Silvio: *See—*
Camosso, Domenico; Ragazzoni, Silvio; and Colanzi, Franco, 4,610,225, Cl. 123-90.550.
Raj-karne, Dattatraya G.: *See—*
Asmuth, Richard L.; DiCarlo-Cottone, Melchior J.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Raj-karne, Dattatraya G.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,096, Cl. 179-18.00B.
Raleigh, Freddie L.: *See—*
Bell, Frederick K.; and Raleigh, Freddie L., 4,610,089, Cl. 33-1.00M.
Raley, John M., to Kimberly-Clark Corporation. Fibrous web with reinforced marginal portions, method for making the same and absorbent article incorporating the same. 4,610,685, Cl. 604-366.000.
Ralph, Eugene L.: *See—*
Minahan, Joseph A.; Ralph, Eugene L.; and Dill, Hans G., 4,610,077, Cl. 29-572.000.
Ramser, Robert A.: *See—*
Jacoby, John E.; Yu, Ho; and Ramser, Robert A., 4,610,295, Cl. 164-5.000.
Raney, Donald: *See—*
Kubala, Robert; LaPolla, Anthony; Raney, Donald; and Morse, Charles W., 4,610,206, Cl. 104-26.00B.
Ranke, Horst: *See—*
Bauer, Volker; and Ranke, Horst, 4,611,330, Cl. 373-14.000.
Rapaich, Mark, to Heath Company. Audio spectrum analyzer operable in a difference mode. 4,611,343, Cl. 381-103.000.
Rask, Richard O.: *See—*
Delmege, Dale; and Rask, Richard O., 4,610,487, Cl. 384-18.000.
Rasmussen, Robert, to Progressive Assembly Machine Co., Inc. Fluid dispensing system. 4,610,377, Cl. 222-288.000.
Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,610,820, Cl. 540-200.000.
DiNinno, Frank P.; Leanza, William J.; and Ratcliffe, Ronald W., 4,610,823, Cl. 540-350.000.
Rauch, Samuel. Toothbrush. 4,610,045, Cl. 15-167.00R.
Rauma-Repola Oy: *See—*
Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, 4,610,809, Cl. 252-500.000.
Rautenberg, Horst, to Windmoller & Holscher. Guide structure for apparatus for sack end forming apparatus. 4,610,654, Cl. 493-477.000.
Ray, Charles D., to Charles D. Ray, Ltd. Malleable force-fulcrum retractor. 4,610,243, Cl. 128-20.000.
Ray, Donald L.: *See—*
Eder, Robert L.; and Ray, Donald L., 4,611,103, Cl. 200-38.00B.
Ray, Jimmy C.; and Mathews, H. Wayne, to Industrial Innovations, Inc. Cable analyzer with D. C. functions. 4,611,099, Cl. 179-175.000.
Raychem Corporation: *See—*
Derencsenyi, Tibor T., 4,611,018, Cl. 524-130.000.
Follette, Martha G., 4,610,921, Cl. 428-304.400.
Jervis, James E., 4,610,738, Cl. 156-49.000.
Raymond, Flaujac, to Seailles & Tison SA. Device for turning paper in verso-recto printing. 4,610,198, Cl. 101-223.000.
Raytheon Company: *See—*
Lumelsky, Leon; and Shapiro, Jonathan S., 4,611,283, Cl. 364-414.000.
Morrison, Raymond C., 4,611,146, Cl. 313-446.000.
RCA Corporation: *See—*
Craig, Daniel E.; Walker, Clarence E., Jr.; and Wilbur, Leonard P., Jr., 4,610,636, Cl. 445-68.000.
Fernandez, Antonio, 4,611,196, Cl. 340-347.0AD.
Harwood, Leopold A., 4,611,240, Cl. 358-23.000.
Hoover, Alan A.; Luz, David W.; and Lendaro, Jeffery B., 4,611,151, Cl. 315-368.000.
Kumar, Mahesh, 4,611,184, Cl. 333-100.000.
Nowak, David, 4,610,159, Cl. 73-116.000.
Powers, Kerns H., 4,611,225, Cl. 358-140.000.
Shanley, Robert L., II, 4,611,239, Cl. 358-19.000.
Reak, B. Bennett: *See—*
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Recycloplast AG: *See—*
Weichenrieder, Erich, 4,610,399, Cl. 241-101.00B.
Reddy, Nagendranath K.: *See—*
Markland, Francis S., Jr.; and Reddy, Nagendranath K., 4,610,879, Cl. 424-94.000.
Reddy, Redreddy S., to Vapor Corporation. Electromechanical switch actuator having high security key actuator. 4,611,104, Cl. 200-43.080.
Reder, Thomas E.: *See—*
Elder, Charles D.; and Reder, Thomas E., 4,610,166, Cl. 73-818.000.
Redondo Abad, Angel L.: *See—*
Nogueira, Eduardo D.; and Redondo Abad, Angel L., 4,610,723, Cl. 75-101.00R.
Reed Tool Company: *See—*
Daly, Jeffery E.; and Pastusek, Paul E., 4,610,313, Cl. 175-40.000.
Reese, Dyke W.; Pace, Ray S.; and McKenzie, Lee F., to Hughes Tool Company. Non-retarding fluid loss additives for well cementing compositions. 4,610,306, Cl. 166-293.000.
Refregier, Jean-Louis L.: *See—*
Madrange, Annie G.; and Refregier, Jean-Louis L., 4,610,261, Cl. 132-7.000.
Regent, Robert M., to A. O. Smith Harvestore Products, Inc. Bulk storage containers. 4,610,376, Cl. 222-185.000.
Regie Nationale des Usines Renault: *See—*
Houley, Daniel; and Baudoin, Patrice, 4,610,181, Cl. 74-792.000.
Reh, Wolfgang; and Schelle, Siegfried, to Peroxid-Chemie GmbH. Process for the production of potassium peroxymonosulphate triple salt. 4,610,865, Cl. 423-513.000.
Reimert, Larry E., to Dril-Quip, Inc. Connector. 4,610,467, Cl. 285-24.000.
Reinecke, Paul: *See—*
Kraatz, Udo; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Hanssler, Gerd, 4,610,996, Cl. 514-383.000.
Remedios, Thomas A.: *See—*
Dudley, Catherine M.; and Remedios, Thomas A., 4,611,297, Cl. 364-900.000.
Remmerie, Herman J.: *See—*
Mampaey, Jozef L.; and Remmerie, Herman J., 4,610,939, Cl. 430-33.000.

Remp, Thomas E.; Dreyfuss, Wilfried; and Muller, Kurt, to Dreyfuss, Wilfried; and Remp, Thomas E. Frame for the transport and storage of pipes. 4,610,362, Cl. 211-59.400.

Rempfler, Hermann: *See—*
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,610,980, Cl. 514-94.000.

Renzetti, Robin, to Dunnington Co. Spindle mount for rotary abrasive tools or the like. 4,610,110, Cl. 51-168.000.

Research Corporation: *See—*
Pearson, Albert M.; Brooks, Roger I.; Hogberg, Maynard G.; Pestka, James J.; and Gray, J. Ian, 4,610,877, Cl. 424-88.000.

Reti, Adrian R.; and Benn, James A., to Sterimatics Company Limited Partnership. Process and system for producing sterile water and sterile aqueous solutions. 4,610,790, Cl. 210-636.000.

Revial, Gilbert: *See—*
D'Angelo, Jean; Revial, Gilbert; Azerad, Robert; and Buisson, Didier, 4,610,826, Cl. 558-44.000.

Reylek, Robert S.; and Berg, James G., to Minnesota Mining and Manufacturing Company. Insulated connected sheet material. 4,610,908, Cl. 428-141.000.

Reyniers, Lance. Method and apparatus for cleaning and filling an aquarium. 4,610,784, Cl. 210-169.000.

Rhodes, Clifford A. Shoe with replaceable heel. 4,610,100, Cl. 36-42.000.

Ribbans, Robert C., III: *See—*
Effenberger, John A.; Ribbans, Robert C., III; and Keese, Frank M., 4,610,918, Cl. 428-245.000.

Ribeiro, Nana: *See—*
Johnson, Douglas R.; and Ribeiro, Nana, 4,610,350, Cl. 206-216.000.

Rice, Rex: *See—*
Lewis, Terrence E.; Smiley, Stephen A.; Rice, Rex; Lipkes, Zeev; and Nelson, John A., 4,611,238, Cl. 357-81.000.

Rich, Theodore C., to Richland Glass Company, Inc. Laser etch monitoring system. 4,611,115, Cl. 250-216.000.

Richard, Kenneth L. Downflow dust filter. 4,610,704, Cl. 55-302.000.

Richards, Craig D.: *See—*
Johnson, Erlon F.; and Richards, Craig D., 4,611,213, Cl. 343-702.000.

Richland Glass Company, Inc.: *See—*
Rich, Theodore C., 4,611,115, Cl. 250-216.000.

Richter, Sabine: *See—*
Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, 4,610,805, Cl. 252-299.620.

Ricoh Company, Ltd.: *See—*
Ishikawa, Chuji; and Araki, Shigeyuki, 4,611,216, Cl. 346-75.000.
Koizumi, Yutaka, 4,610,529, Cl. 355-4.000.

Riddle, David S.: *See—*
Amos, James R.; Greathouse, Chester K.; and Riddle, David S., 4,610,582, Cl. 409-163.000.

Riemersma, Pieter, to U.S. Philips Corporation. Hair trimmer. 4,610,085, Cl. 30-90.000.

Rilecart S.p.A.: *See—*
Pigna, Daniele P., 4,610,590, Cl. 412-11.000.

Riley, Clifford. Flow analysis. 4,610,544, Cl. 356-410.000.

Riley, Michael J.: *See—*
Arzberger, William A.; Riley, Michael J.; LaLumiere, Edward J.; and DeCastro, William H., Jr., 4,610,145, Cl. 62-127.000.

Ringelstein, Hans-Martin: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,610,631, Cl. 433-228.100.

Ringlien, James A., to Owens-Illinois, Inc. System for detecting selective refractive defects in transparent articles. 4,610,542, Cl. 356-240.000.

Rinno, Helmut: *See—*
Engel, Dieter; Mondt, Josef; and Rinno, Helmut, 4,610,898, Cl. 427-379.000.

RIV-SKF Officine di Villar Perosa S.p.A.: *See—*
Donn, Vittorio; and Bertetti, Paolo, 4,610,645, Cl. 474-112.000.

RIV-SKF Officine di Villar Perosa, SpA: *See—*
Camosso, Domenico; Ragazzoni, Silvio; and Colanzi, Franco, 4,610,225, Cl. 123-90.550.

Rivers-Farrell, Stacia A.; and Wright, Antony P., to Dow Corning Corporation. Resinous copolymeric siloxanes containing alkenyldimethylsiloxanes. 4,611,042, Cl. 528-32.000.

Robert Bosch GmbH: *See—*
Kuhlmann, Gerhard, 4,610,088, Cl. 30-372.000.

Roberts, Douglas H.: *See—*
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,610,254, Cl. 128-419.00D.

Roberts, Jon A.; and Hendrickson, Thomas E., to Honeywell Inc. Method of making an acoustic microphone. 4,610,062, Cl. 29-25.410.

Robertshaw Controls Company: *See—*
Fowler, Daniel L., 4,611,295, Cl. 364-184.000.
Kelly, Samuel T., 4,610,269, Cl. 137-489.500.
Kelly, Samuel T., 4,610,425, Cl. 251-129.200.

Robinson, Joseph M. Garden space saver. 4,610,106, Cl. 47-45.000.

Robishaw, Alces P.; and Robishaw, Paul A. Construction components with improved locking system. 4,610,215, Cl. 114-249.000.

Robishaw, Paul A.: *See—*
Robishaw, Alces P.; and Robishaw, Paul A., 4,610,215, Cl. 114-249.000.

Robotica S.r.l.: *See—*
Scavino, Mario, 4,610,387, Cl. 228-1.100.

Robson, George; and Anderson, Paul. Level. 4,610,094, Cl. 33-367.000.

Rockwell International: *See—*
Grimes, Mark W., 4,611,097, Cl. 179-84.00A.

Rockwell, Ned M., to Stepan Company. Phosphorous acid catalyzed phenol esterification. 4,610,825, Cl. 260-410.500.

Rodov, Vladimir: *See—*
Harrington, Alan L.; and Rodov, Vladimir, 4,610,730, Cl. 148-1.500.

Rodriguez, Don R. Metal frame homes. 4,610,114, Cl. 52-93.000.

Rodriguez, Jean-Jacques, to Kugler, Fonderie et Robinetterie S.A. Cold and hot water mixer tap with ceramic plates controlled by means of a thermostat. 4,610,393, Cl. 236-12.150.

Roed, Harald, to A/S Hydraulik Brattvag. Hoisting means including constant tension hoist wire. 4,610,365, Cl. 212-262.000.

Rogers Corporation: *See—*
Landi, Vincent R., 4,610,495, Cl. 339-75.0MP.

Rogers, John W.: *See—*
Box, William A.; and Rogers, John W., 4,610,408, Cl. 242-78.600.

Rogers, Randall J.: *See—*
Howey, Jon A.; and Rogers, Randall J., 4,610,352, Cl. 206-313.000.

Rogier, Leonce; and Lavaquerie, Jacques, to SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile. Wheel hub with built-in brake. 4,610,331, Cl. 188-18.00A.

Rohm and Haas Company: *See—*
Galluccio, Richard A.; Lai, Chung-Yin; and Neveu, Christian D., 4,611,031, Cl. 525-310.000.

Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, to W. Schlafhorst & Co. Compressed air thread splicing device. 4,610,132, Cl. 57-22.000.

Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, to W. Schlafhorst & Co. Make-ready device for readying a thread end. 4,610,133, Cl. 57-22.000.

Rokach, Joshua: *See—*
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,611,056, Cl. 544-31.000.

Rolls-Royce Limited: *See—*
Sibley, John D., 4,610,410, Cl. 244-12.500.

Rolls-Royce plc: *See—*
Alexander, Eric A., 4,610,135, Cl. 60-39.010.

Rolscreen Company: *See—*
Billingsley, Michael J., 4,610,472, Cl. 292-54.000.

Rop, Jaap; and Verboekend, Jacobus H. A., to Teepak, Inc. Methods and materials for splicing tubular food casings. 4,610,742, Cl. 156-158.000.

Rose, William H.: *See—*
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,611,262, Cl. 361-421.000.

Rosen, Gerald M. Skin-marking compositions and devices, and their use. 4,610,806, Cl. 252-301.160.

Rosenberg, Helmut W. G., to Kendall Company, The. Method of performing a nephrostomy procedure with connector assembly. 4,610,660, Cl. 604-49.000.

Rosenberg, Helmut W. G., to Kendall Company, The. Nephrostomy catheter with side connector. 4,610,663, Cl. 604-99.000.

Rosenberg, Jerome C.: *See—*
Amberg, Robert L.; and Rosenberg, Jerome C., 4,610,484, Cl. 303-100.000.

Rosenberg, Lior, to Brig Research Ltd. Method and apparatus for the prevention of pressure sores. 4,610,253, Cl. 128-382.000.

Rosenberg, Norman, to University of Medicine and Dentistry of New Jersey. Surgical finger assembly. 4,610,248, Cl. 128-325.000.

Rosler, Richard S.: *See—*
Engle, George M.; and Rosler, Richard S., 4,610,748, Cl. 156-345.000.

Rosselet, Ernest: *See—*
Kudelski, Stefan; and Rosselet, Ernest, 4,611,168, Cl. 324-174.000.

Rothfuss, Robert G.; Bilotti, Federico; Chow, Hector; Hueil, J. Charles; and Sambi, Narinderjit S., to Senmed, Inc. Disposable linear surgical stapler. 4,610,383, Cl. 227-19.000.

Roussel Uclaf: *See—*
D'Angelo, Jean; Revial, Gilbert; Azerad, Robert; and Buisson, Didier, 4,610,826, Cl. 558-44.000.

RTE Corporation: *See—*
Mikulecky, Harvey W., 4,611,189, Cl. 335-37.000.

Rudnic, Edward M.: *See—*
Jain, Nemichand B.; Gertie, Linda P.; and Rudnic, Edward M., 4,610,870, Cl. 424-19.000.

Rudolph, Kenneth: *See—*
Beck, Niels J.; Gilbert, Edward T.; Weseloh, William E.; and Rudolph, Kenneth, 4,610,267, Cl. 137-329.300.

Rudy, Michael A.; and Lisanti, Vincent F., to Caries Research Group of Rochester, Inc. Composition and method for making a clear aqueous solution free of calcium phosphate crystals. 4,610,873, Cl. 424-52.000.

Ruesen, Ritsaert L. J. M.: *See—*
Tieleman, Rudolf J.; and Ruesen, Ritsaert L. J. M., 4,610,050, Cl. 17-11.000.

Ruhl, Friedel, to Ernst Leitz Wetzlar GmbH. Diaphragm blades. 4,610,524, Cl. 354-274.000.

Ruigrok, Franciscus B. M., to Heras Holding Company B.V. Gate. 4,610,109, Cl. 49-381.000.

Russell, Frederick E., to Protectaire Systems Co. Sludge separation apparatus. 4,610,785, Cl. 210-195.100.

Russo, Ronald D., to Superior Healthcare Group, Inc. Gastroenteric feeding tube. 4,610,673, Cl. 604-270.000.

S.A.M.P. S.p.A. Meccanica di Precisione: *See*—
Maccaferri, Angelo, 4,610,404, Cl. 242-25.00R.

S. Franzen Sohne (GmbH & Co.): *See*—
Duringer, Rudi H., 4,610,152, Cl. 70-30.000.

S.I.E., Inc.: *See*—
Hoover, C. G., 4,610,299, Cl. 165-80.200.

S.M.S. Industries, Inc.: *See*—
Hostetler, Glenn, 4,610,354, Cl. 206-349.000.

S.R.P.M.:Societe de Realisation de Productions Metalliques: *See*—
Broyer, Julien; and de Marancour, Bernard M., 4,610,262, Cl. 135-23.000.

Saarinen, Kari: *See*—
Eklund, Dan; Erkkila, Jukka; Ingman, Matti; Lassus, Anders; Peltonen, Kauko; and Saarinen, Kari, 4,610,761, Cl. 162-157.600.

Sacristan, Aurelio: *See*—
Foguet, Rafael; Forne, Ernesto; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,610,998, Cl. 514-399.000.

Sahler, John T.; and Laubach, Marianne G., to Binney & Smith, Inc. Transformable stencil toy. 4,610,096, Cl. 33-565.000.

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Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,610,820, Cl. 540-200.000.

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Derivaz, Charles, 4,610,285, Cl. 144-231.000.

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Concato, Antonio, 4,610,040, Cl. 4-622.000.

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Laurent, Sebastian M.; and Sanders, Robert N., 4,610,882, Cl. 424-154.000.
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Damon, Robert E., II, 4,611,063, Cl. 548-406.000.

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Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,610,311, Cl. 169-45.000.

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Busch, Dieter; and Sannig, Ulrich, 4,610,134, Cl. 57-417.000.

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Furukawa, Yoshimi; and Sano, Shoichi, 4,610,455, Cl. 280-91.000.

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Froeschke, Reinhard, 4,610,615, Cl. 425-8.000.

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Hikari, Kazuo, 4,610,343, Cl. 192-105.0BA.

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Nakayama, Yoshio; Abe, Fuminori; and Nagasawa, Naofumi, 4,611,135, Cl. 307-572.000.

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Sato, Hiroshi: *See*—
Miyamoto, Yosuke; Goto, Hajime; Sato, Hiroshi; Okano, Hiroshi; and Iijima, Masao, 4,610,891, Cl. 427-3.000.

Sato, Mikio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,610,804, Cl. 252-299.100.

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Sato, Shinji, to Fujitsu Limited. Masterslice semiconductor device. 4,611,236, Cl. 357-45.000.

Sato, Shinsei: *See*—
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Sato, Tadao: *See*—
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Shimura, Takaki; Murakami, Keiichi; Miwa, Hirohide; Sato, Takuso; and Ichida, Nobuyuki, 4,610,255, Cl. 128-660.000.

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Kobayashi, Satoru; Sato, Yoshiaki; and Imaizumi, Haruo, 4,610,552, Cl. 374-160.000.

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Kiersarsky, Albert S.; Sauer, Earl S.; Vesperman, William C.; and Wilson, Max K., 4,610,909, Cl. 428-202.000.

Savich, Peter P., to Union Carbide Corporation. Heat sealing and cutting means. 4,610,653, Cl. 493-470.000.

Sayama, Norio: *See—*
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Scavino, Mario, to Robotica S.r.l. Device for bonding wire leads in electronic components. 4,610,387, Cl. 228-1.100.

Schafer, Walter: *See—*
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Schambeck, Herbert; Hilliges, Dieter; and Foerst, Hans, to Dyckerhoff & Widmann Aktiengesllschaft. Multiple-span bridge support system for vehicles with high braking forces. 4,610,117, Cl. 52-227.000.

Scharmann GmbH & Co.: *See—*
Malzkorn, Matthias; and Holz, Helmut, 4,610,583, Cl. 409-211.000.
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Reh, Wolfgang; and Schelle, Siegfried, 4,610,865, Cl. 423-513.000.

Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, to VEB Werk fur Fernsehelektronik im VEB Kombinat Mikroelektronik. Nematic liquid crystal mixtures. 4,610,805, Cl. 252-299.620.

Schembri, John J., to Pacific Bell. Bunching block for McCulloh circuits and method of operation. 4,611,100, Cl. 179-175.30F.

Schenach, Wilfried J. Roof cladding. 4,610,121, Cl. 52-520.000.

Scherer, George W.: *See—*
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Schijven, Lucas W. M., to U.S. Philips Corporation. Cassette recorder with low-energy pause control. 4,611,258, Cl. 360-105.000.

Schiller, Edward, to Ampex Corporation. Magnetic transducer structure having reduced track width and a method of manufacturing thereof. 4,611,259, Cl. 360-125.000.

Schindler, Ursula: *See—*
Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,610,984, Cl. 514-235.000.

Schlintz, Neal L.: *See—*
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Bockett-Pugh, Charles P., 4,611,302, Cl. 365-229.000.

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Meek, Dale E., 4,610,308, Cl. 166-321.000.

Schmid, Norbert; and Schonwald, Siegfried, to Siemens Aktiengesellschaft. Rotary gas compressor. 4,610,602, Cl. 417-68.000.

Schmid, Samuel; and Novet, Hans-Peter, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Ammunition container for belted cartridges. 4,610,191, Cl. 89-34.000.

Schmidt, Donald M.: *See—*
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Schmidt, Erik, to Seco Tools AB. Cutting insert for thread cutting. 4,610,186, Cl. 76-101.00R.

Schmidt, Ernest A.; and Schmidt, Donald M. Method and apparatus for isolating well pump units. 4,610,176, Cl. 74-108.000.

Schmidt, Frederick; and Carlson, O. Norman, to United States of America, Energy. Method for preparing high purity vanadium. 4,610,720, Cl. 75-84.000.

Schmidt, Werner J., to Lever Brothers Company. Low-trans fats and oil- and water emulsion spreads containing such fats. 4,610,889, Cl. 426-602.000.

Schmidts, Klaus; Therolf, Dieter; and Weber, Ulrich, to Hoesch Aktiengesellschaft. Hydraulic press. 4,610,618, Cl. 425-383.000.

Schneider, Barry L.; Jensen, Marvin E.; and Mohiuddin, Mahmood, to Hollister Incorporated. Ostomy appliance coupling ring construction. 4,610,676, Cl. 604-339.000.

Schneider, Helmut A.; and Fazio, Dominick, to Ziyad Incorporated. Integrated printer and tray paper feeding apparatus. 4,610,445, Cl. 271-160.000.

Schneider, Hermann: *See—*
Hinsken, Hans; Mayerhoefer, Horst; Mueller, Wolfgang; and Schneider, Hermann, 4,611,016, Cl. 529-99.000.

Schneider Medintag AG: *See—*
Weikl, Andreas; and Merkel, Volkmar, 4,610,662, Cl. 604-53.000.

Schneider, Richard T., to United States of America, Air Force. Fly's eye sensor nonlinear signal processing. 4,611,124, Cl. 250-578.000.

Schonafinger, Karl; Beyerle, Rudi; Schindler, Ursula; Martorana, Piero; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. Substituted piperazin-1-yl-acetic acid amides. 4,610,984, Cl. 514-235.000.

Schonleben, Willibald: *See—*
Buethe, Ingolf; Marx, Matthias; and Schonleben, Willibald, 4,611,083, Cl. 560-351.000.

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Schreder, Felix, to EGO Elektro-Gerate Blanc und Fischer. Electric hotplate. 4,611,112, Cl. 219-455.000.

Schrems-Adam, Gabriele: *See—*
Schrems, Hans T.; and Schrems-Adam, Gabriele, 4,610,629, Cl. 433-72.000.

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Schuck, Paul E. Easel. 4,610,414, Cl. 248-449.000.

Schuldt, Marlo E., to Harding and Harris Behavioral Research, Inc. Information storage and retrieval system and method. 4,611,298, Cl. 364-900.000.

Schulein, Rolf G., to Leifheit Aktiengesellschaft. Wiping cloth with edge reinforcement. 4,610,044, Cl. 15-119.00$^{A}$.

Schulman, Marvin: *See—*
Kirkpatrick, Paul A.; Schulman, Marvin; Lehmann, Douglas M.; and Hegadorn, Joseph L., 4,610,760, Cl. 159-4.010.

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Schultz, Peter G., to Eastman Kodak Company. Method for forming a ribbon blender. 4,610,068, Cl. 29-418.000.

Schulz, Hans-Werner: *See—*
Dirmeyer, Josef; Kinzler, Hans; Lahner, Karlheinz; and Schulz, Hans-Werner, 4,611,185, Cl. 333-167.000.

Schulz, Kenneth, to Soletude, Inc. Skylight assembly. 4,610,116, Cl. 52-204.000.

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Schwartz, Arthur; and Scott, Paul O., to Wagner Folding Box Corp. Four-pack bottle carrier. 4,610,349, Cl. 206-175.000.

Schwartz, Frederic W., to Cable Electric Products, Inc. Refractor for electric light wall unit. 4,611,266, Cl. 362-226.000.

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Schwarz, Gerd-Ulrich; Theobald, Hans; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Halovinylbenzyl esters and their use for controlling pests. 4,611,010, Cl. 514-521.000.

Schwarzer, Fred M.: *See—*
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Scott, Ernest R.: *See—*
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Seaborn, Douglas K.; and Dowell, William T., to Monsanto Company. Warp monitoring and beaming process. 4,610,059, Cl. 28-187.000.

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Raymond, Flaujac, 4,610,198, Cl. 101-223.000.

Seaman, Gary G.: *See—*
Anderson, Carl R.; and Seaman, Gary G., 4,610,084, Cl. 29-834.000.

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Seibert, Frank; and Wetzel, Gustav, to Endress u. Hauser GmbH u. Co. Method and arrangement for the automatic stabilization of a scintillation detector. 4,611,117, Cl. 250-252.100.

Seiko Epson Corporation: *See—*
Suzuki, Takashi; Matsuzaki, Makoto; Matsuzawa, Masanao; and Miyazawa, Yoshinori, 4,610,554, Cl. 400-124.000.

Seiko Instruments & Electronics Ltd.: *See—*
Kamamori, Hitoshi; Tsunoda, Yukiyoshi; Suginoya, Mitsuru; Sano, Yutaka; and Terada, Yumiko, 4,610,507, Cl. 350-335.000.
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Seitz, Hans: *See—*
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Seiyama, Tetsuro; Arai, Hiromichi; and Kunisaki, Toshiya, to Yazaki Corporation. Material of oxygen ion conductor. 4,610,867, Cl. 423-635.000.

Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, to Fuji Electric Corporate Research & Development Co., Ltd.; and Fuji Electric Company, Ltd. Semiconductor radiation detector. 4,611,224, Cl. 357-30.000.

Sekiguchi, Hisashi; Kobayashi, Norio; and Ohgishi, Hideo, to Dainippon Ink and Chemicals, Inc. Epoxy resin composition. 4,611,036, Cl. 525-481.000.

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Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00F.

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Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, to Nissan Motor Company. Alarm system and method for sensing a stand-by state in a driver drowsiness detection system. 4,611,199, Cl. 340-576.000.

Sellani, Mario A.: *See*—
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Senco Products, Inc.: *See*—
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Senmed, Inc.: *See*—
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Sepinwall, Jerry: *See*—
Baruth, Herman W., Jr.; Berger, Leo; Corraz, Alfred J.; and Sepinwall, Jerry, 4,610,989, Cl. 514-282.000.

Serester, Kalman: *See*—
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Sermatech International, Inc.: *See*—
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Serpentine Corporation: *See*—
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Setsune, Kentaro; Yamazaki, Osamu; Wasa, Kiyotaka; and Tazuke, Kazuo, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing surface acoustic wave device. 4,610,894, Cl. 427-53.100.

Seynhaeve, Andre G., to Ste Delsey. Frame for flexible suitcase and flexible suitcase making use of a frame of this type. 4,610,333, Cl. 190-18.00A.

SGS-ATES Componenti Elettronici SpA: *See*—
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Shaffer, David T.: *See*—
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,611,262, Cl. 361-421.000.

Shah, Ashwin H., to Texas Instruments Incorporated. Low power decoder-driver circuit. 4,611,131, Cl. 307-449.000.

Shah, Kirti C., to General Electric Co. Ultrasonic temperature sensor. 4,610,551, Cl. 374-117.000.

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Ballard, Larry, 4,610,916, Cl. 428-224.000.

Shanley, Robert L., II, to RCA Corporation. Oscillator synchronizing system for eliminating static phase errors. 4,611,239, Cl. 358-19.000.

Shapiro, David: *See*—
Peach, Roy W.; Kahn, William M.; and Shapiro, David, 4,611,307, Cl. 364-900.000.

Shapiro, Jonathan S.: *See*—
Lumelsky, Leon; and Shapiro, Jonathan S., 4,611,283, Cl. 364-414.000.

Shapiro, Paul J.: *See*—
Stolfi, Fred R.; and Shapiro, Paul J., 4,610,143, Cl. 62-6.000.

Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, 4,610,510, Cl. 350-334.000.
Furukawa, Toshio, 4,610,257, Cl. 128-689.000.
Ito, Fukusaburo; Kataoka, Hiroshi; and Itoh, Keizoh, 4,610,534, Cl. 355-15.000.
Kinashi, Hiroshi; and Takahashi, Kozo, 4,610,528, Cl. 355-3.0DD.
Machino, Katsuyuki; Ise, Masahiro; and Tanaka, Hidehiko, 4,611,274, Cl. 364-200.000.
Matsuura, Syuuji, 4,611,179, Cl. 330-293.000.
Nishimura, Katsuji; and Yamamoto, Hachizou, 4,611,286, Cl. 364-405.000.
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, 4,610,912, Cl. 428-213.000.

Shealy, Y. Fulmer; and Krauth, Charles A., to Southern Research Institute. (Alkylsulfonyl)methanesulfonates as anticancer agents. 4,611,074, Cl. 558-51.000.

Shell Oil Company: *See*—
Dong, Walter; and Friend, Peter S., 4,611,076, Cl. 558-351.000.
Dong, Walter; and Stoutamire, Donald W., 4,611,077, Cl. 558-351.000.
Mansuri, Muzammil M.; and McArthur, Alasdair, 4,610,717, Cl. 71-92.000.
Tsahalis, Demosthenes T., 4,610,794, Cl. 210-776.000.

Shelton, David: *See*—
Dibert, Grant, Jr.; and Shelton, David, 4,610,489, Cl. 312-227.000.

Shelton, Samuel V. Solid adsorbent heat pump system. 4,610,148, Cl. 62-480.000.

Shepitka, Joel S.: *See*—
Martin, Fred D.; Hatch, Melvin J.; Shepitka, Joel S.; and Donaruma, Lorraine G., 4,610,305, Cl. 166-275.000.

Sherbondy, William A., to Jalimar Industries Inc. Ball dispenser. 4,610,373, Cl. 221-155.000.

Sherritt Gordon Mines Limited: *See*—
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,610,724, Cl. 75-118.00R.

Sherwood Medical Company: *See*—
Ewalt, Paul R.; Leigh, Harold G.; and Gilson, Richard W., 4,610,672, Cl. 604-220.000.

Shimada, Satoru: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.

Shimamura, Hideaki: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.
Sakata, Masao; Kobayashi, Shigeru; Abe, Katsuo; Shimamura, Hideaki; Kamei, Tsuneaki; Kasahara, Osamu; Ogishi, Hidetsugu; and Oyamada, Takeshi, 4,610,774, Cl. 204-298.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,610,644, Cl. 474-82.000.

Shimazaki, Yukihiro: *See*—
Hasegawa, Yo; Murakawa, Satoshi; and Shimazaki, Yukihiro, 4,610,810, Cl. 252-511.000.

Shimazu, Yuji; and Miyamoto, Makoto, to Hamamatsu Photonics Kabushiki Kaisha. Composite light source. 4,611,143, Cl. 313-111.000.

Shimizu, Setsuo: *See*—
Vicki, Frank J.; and Shimizu, Setsuo, 4,610,157, Cl. 73-1.00R.

Shimizu, Wataru: *See*—
Suzuki, Kimio; Toda, Jitsuo; and Shimizu, Wataru, 4,611,269, Cl. 364-174.000.

Shimogawa, Toshiaki: *See*—
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, 4,610,480, Cl. 297-478.000.

Shimokawa, Masahide: *See*—
Miyazawa, Takeshi; Sueshige, Hiroshi; Niikawa, Yutaka; and Shimokawa, Masahide, 4,610,335, Cl. 192-3.620.

Shimura, Shinya: *See*—
Matsuzaka, Shoji; and Shimura, Shinya, 4,610,958, Cl. 430-567.000.

Shimura, Takaki; Murakami, Keiichi; Miwa, Hirohide; Sato, Takuso; and Ichida, Nobuyuki, to Fujitsu Limited. Ultrasonic non-linear parameter measuring system. 4,610,255, Cl. 128-660.000.

Shing, Yuh-Han: *See*—
Choudary, Uppala V.; Shing, Yuh-Han; Potter, Richard R.; Ermer, James H.; and Kapur, Vijay K., 4,611,091, Cl. 136-260.000.

Shinkai, Ichiro: *See*—
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., 4,611,081, Cl. 560-53.000.

Shinyagaito, Tatsuya: *See*—
Machida, Toyotaka; Ueguri, Shigeharu; Matsumoto, Hiroaki; Nakamura, Akira; and Shinyagaito, Tatsuya, 4,611,228, Cl. 358-149.000.

Shinzawa, Motohiro; and Nakajima, Yasuo, to Nissan Motor Company, Limited. Exhaust particle removing system for an internal combustion engine. 4,610,138, Cl. 60-286.000.

Shipley Company Inc.: *See*—
Tubergen, Timothy S.; and Benjamin, Terrell A., 4,610,895, Cl. 427-98.000.

Shirai, Akira; Takizawa, Kazushige; Nishikawa, Yasuhisa; and Katoh, Tadayuki, to Fuji Photo Film Co., Ltd.; and Nippon Light Metal Co., Ltd. Aluminum-zirconium alloy support for lithographic printing plate. 4,610,946, Cl. 430-278.000.

Shiroyama, Kazuhiko; Haraguchi, Tamotsu; and Sakai, Yoshiaki, to Teac Corporation. Vibration controlled data transfer apparatus with a double sided flexible magnetic disk. 4,611,257, Cl. 360-104.000.

Shishido, Tadao: *See*—
Torigoe, Masaaki; Inagaki, Yoshio; and Shishido, Tadao, 4,610,954, Cl. 430-445.000.

Shorr, Jacob: *See*—
Van Gils, Gerard J.; and Shorr, Jacob, 4,610,792, Cl. 210-639.000.

Shosaku, Tsukagoshi, to Oki Electric Industry Co., Ltd. Digital-to-analog converter. 4,611,195, Cl. 340-347.0DA.

Showa Entetsu Co., Ltd.: *See*—
Takayasu, Teruko, 4,610,773, Cl. 204-285.000.

Shufflebarger, William S.: *See*—
Buschur, Jeffrey J.; Franklin, Ernest G.; and Shufflebarger, William S., 4,610,046, Cl. 15-250.160.

SHW Schwabische Huttenwerke GmbH: *See*—
Andrae, Wolfhart; Andrae, Hans P.; Beyer, E. H. Erwin; Bayer, Karl; and Lohmann, Manfred, 4,610,431, Cl. 254-93.0HP.

Sibley, John D., to Rolls-Royce Limited. Compound helicopter and powerplant therefor. 4,610,410, Cl. 244-12.500.

Siegfried, Bernard: *See*—
Gold-Aubert, Philippe; Melkonian, Diran; Vachta, Jindrich; Valter, Karel; Siegfried, Bernard; and Hugentobler, Stephane, 4,611,057, Cl. 544-301.000.

Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut, 4,610,947, Cl. 430-296.000.
Dirmeyer, Josef; Kinzler, Hans; Lahner, Karlheinz; and Schulz, Hans-Werner, 4,611,185, Cl. 333-167.000.
Fazekas, Peter; and Otto, Johann, 4,611,119, Cl. 250-307.000.
Hessenmuller, Horst, 4,611,323, Cl. 370-79.000.
Niedermayr, Erich, 4,611,296, Cl. 364-513.000.

Patalong, Hubert, 4,611,128, Cl. 307-252.00B.
Schmid, Norbert; and Schonwald, Siegfried, 4,610,602, Cl. 417-68.000.

Siemens Corporate Research and Support, Inc.: *See*—
Southard, Gary, 4,611,320, Cl. 370-13.000.

Signori, Antonio. Shock-absorbing shoe construction. 4,610,099, Cl. 36-3.00B.

Sih, John C., to Upjohn Company, The. Pyridyl-substituted benzothiophenes. 4,611,059, Cl. 546-274.000.

Silvestrini, Thomas A.; and Laptewicz, Joseph E., Jr., to Pfizer Hospital Products Group, Inc. Triaxially-braided fabric prosthesis. 4,610,688, Cl. 623-1.000.

Sinclair, Robert A.: *See*—
Brown-Wensley, Katherine A.; and Sinclair, Robert A., 4,611,035, Cl. 525-474.000.

Singer Company, The: *See*—
Ferriss, Lincoln S., 4,610,543, Cl. 356-350.000.

Sirrenberg, Wilhelm: *See*—
Marhold, Albrecht; Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Becker, Benedikt; Krehan, Ingomar; and Stendel, Wilhelm, 4,611,003, Cl. 514-452.000.

Sjobom, Axel H., to Sunds Defibrator Aktiebolag. Device at refiners for lignocellulose-containing material. 4,610,400, Cl. 241-261.200.

Skeels, Gary W.; Breck, Donald W., deceased; and by Blass, Harold, executor, to Union Carbide Corporation. Silicon substituted zeolite compositions and process for preparing same. 4,610,856, Cl. 423-328.000.

Skelly, Michael. Hydraulic speed control and braking apparatus for draw works. 4,610,139, Cl. 60-327.000.

Skerlos, Peter C.: *See*—
Campisi, Carl; Kilinskis, David C.; Skerlos, Peter C.; and Sorlie, Egil, 4,610,083, Cl. 29-832.000.

Skf Kugellagerfabriken GmbH: *See*—
Walter, Lothar; Brandenstein, Manfred; and Olschewski, Armin, 4,610,646, Cl. 474-198.000.

SKF Steel Engineering Aktiebolag: *See*—
Santen, Sven, 4,611,332, Cl. 373-24.000.

SKF Steel Enginering AB: *See*—
Astner, Gunnar; Wstergren, Orjan; and Thornblom, Jan, 4,611,110, Cl. 219-121.0PY.

Skudera, William J., Jr.: *See*—
Konig, Charles E.; and Skudera, William J., Jr., 4,611,194, Cl. 340-347.0SH.

Sletzinger, Meyer: *See*—
Volante, Ralph P.; Verhoeven, Thomas R.; Sletzinger, Meyer; McNamara, James M.; Liu, Thomas M. H.; and Corley, Edward G., 4,611,067, Cl. 549-292.000.

Small, Gary G.: *See*—
Duffy, Dennis M.; and Small, Gary G., 4,610,165, Cl. 73-317.000.

Smiley, Stephen A.: *See*—
Lewis, Terrence E.; Smiley, Stephen A.; Rice, Rex; Lipkes, Zeev; and Nelson, John A., 4,611,238, Cl. 357-81.000.

Smith, David E.: *See*—
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,610,801, Cl. 252-181.000.

Smith, Donald R.; and Boyd, Mary G., to Dennison Manufacturing Company. Heat transfer pad decoration and substrates therefore. 4,610,744, Cl. 156-235.000.

Smith International, Inc.: *See*—
DiRienz, Keith A., 4,610,452, Cl. 277-83.000.

Smith, Ronald T.: *See*—
Chern, Mao-Jin; and Smith, Ronald T., 4,610,499, Cl. 350-3.700.

Smith, Winthrop W., Jr.: *See*—
Kane, Jerry A.; and Smith, Winthrop W., Jr., 4,611,208, Cl. 343-5.0CM.

Smyth, William K.; Chen, Richard J.; and Plummer, William T., to Polaroid Corporation. Laser scanning and printing apparatus. 4,610,536, Cl. 355-38.000.

SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile: *See*—
Rogier, Leonce; and Lavaquerie, Jacques, 4,610,331, Cl. 188-18.00A.

Sobue, Hideo; and Ito, Toshiharu, to NGK Spark Plug Co., Ltd. Method of detecting liquid level. 4,610,164, Cl. 73-290.00V.

Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See*—
Esanu, Andre , 4,610,990, Cl. 514-302.000.

Societe en Commandite par Actions dite: Chauvin Arnoux: *See*—
Arnoux, Daniel; Genter, Claude; and Bousquet, Jean, 4,611,174, Cl. 324-424.000.

Sodastream Limited: *See*—
Brooks, Graham L.; Pateman, Antony F.; Thomson, Michael A.; and Scott, John, 4,610,282, Cl. 141-46.000.

Soejima, Shigeo: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,610,741, Cl. 156-89.000.

Soiman, Mihai: *See*—
Ionescu, Dragos; and Soiman, Mihai, 4,610,237, Cl. 123-600.000.

Sokolov, Lev B.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Vikior I., 4,610,850, Cl. 422-131.000.

Soletude, Inc.: *See*—
Schulz, Kenneth, 4,610,116, Cl. 52-204.000.

Sollner, George H.: *See*—
Barta, Donald J.; and Sollner, George H., 4,611,050, Cl. 528-289.000.

Sone, Junichi, to Nippon Electric Co., Ltd. Circuit utilizing Josephson effect. 4,611,132, Cl. 307-462.000.

Sony Corporation: *See*—
Iwase, Seiichiro, 4,611,305, Cl. 364-736.000.
Yoshinaka, Tadaaki; and Noguchi, Toshiaki, 4,611,250, Cl. 360-9.100.

Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, to Citizen Watch Co., Ltd. Liquid crystal color display panels. 4,610,509, Cl. 350-339.00F.

Sorlie, Egil: *See*—
Campisi, Carl; Kilinskis, David C.; Skerlos, Peter C.; and Sorlie, Egil, 4,610,083, Cl. 29-832.000.

Souchere, Claude, to Merlin Gerin. Non-magnetic core current sensor. 4,611,191, Cl. 336-84.00R.

Souma, Houkichi: *See*—
Nakata, Hiroshi; and Souma, Houkichi, 4,610,231, Cl. 123-424.000.

Southard, Gary, to Siemens Corporate Research and Support, Inc. Programmable testing analyzer. 4,611,320, Cl. 370-13.000.

Southern Research Institute: *See*—
Shealy, Y. Fulmer; and Krauth, Charles A., 4,611,074, Cl. 558-51.000.

Spaulding, George E., to Wittek Industries, Inc. Tool for applying and removing a spring clamp. 4,610,187, Cl. 81-9.300.

Spease, Arthur L., to Teleflex Incorporated. Motion transmitting remote control assembly—initial reduced resistance self-adjust. 4,610,180, Cl. 74-501.00P.

Speca, Anthony N., to National Distillers and Chemical Corporation. Intermetallic compounds of Lewis base bridged transition metal-reducing metal complexes and catalytic use thereof. 4,610,974, Cl. 502-113.000.

Speedifix Building Components Pty. Ltd.: *See*—
Holden, John M., 4,610,412, Cl. 248-48.200.

Speelmon, C. Robert: *See*—
Corbett, Darrell H.; and Speelmon, C. Robert, 4,610,402, Cl. 242-7.220.

Speers, Jerry M.: *See*—
Gehrig, George F.; and Speers, Jerry M., 4,610,161, Cl. 73-155.000.

Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile connection process, apparatus and system. 4,610,670, Cl. 604-29.000.

Spensberger, Johann, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Gear or rack-shaped tool for precision machining of tooth flanks particularly of hardened gears. 4,610,577, Cl. 407-27.000.

Spivak, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. Di-(substituted hydroxyphenylthio) alkane and cycloalkane stabilizers and stabilized compositions. 4,611,023, Cl. 524-326.000.

Sposini, Maurizio: *See*—
Gabrielli, Luciano; Lotito, Nicola; and Sposini, Maurizio, 4,611,321, Cl. 370-60.000.

Sprague, Randall B.: *See*—
Butenko, R. Bruce; Sprague, Randall B.; and Bateman, Charles D., 4,611,304, Cl. 364-571.000.

Spreen, George E.; Herold, Hans; and Wysocki, Kazmier, to PMC Industries. Method and apparatus for orienting and delivering dispenser cap assemblies. 4,610,345, Cl. 198-392.000.

Spry, James C., Jr.: *See*—
Markley, Gerald E.; and Spry, James C., Jr., 4,610,779, Cl. 208-212.000.

Srivastava, Gopal K.; and Lee, Ronald B., to Zenith Electronics Corporation. Auto range horizontal automatic phase control. 4,611,229, Cl. 358-158.000.

Staczek, Donald J.: *See*—
Estes, Ann E.; and Staczek, Donald J., 4,610,366, Cl. 215-1.00C.

Staemmler, Erwin: *See*—
Kruger, Heinz; Teubler, Heinz; Schulz, Rene ; and Staemmler, Erwin, 4,610,607, Cl. 417-292.000.

Stamicarbon B.V.: *See*—
Vrinssen, Cornelis H.; van Gennen, Albert A.; and Bongers, Jozef J. M., 4,611,052, Cl. 528-312.000.

Standard Oil Company: *See*—
Catella, Gary C.; Cull, Ronald C.; Dilts, David A.; Koch, Paul E.; and Hartman, Robert A., 4,611,090, Cl. 136-251.000.

Standard Precision, Inc.: *See*—
Delmege, Dale; and Rask, Richard O., 4,610,487, Cl. 384-18.000.

Stanfill, Ira C. Method of and apparatus for monitoring odorizer performance. 4,611,294, Cl. 364-173.000.

Stanley, Gerald R., to Crown International, Inc. Grounded bridge amplifier protection through transistor thermo protection. 4,611,180, Cl. 330-298.000.

Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., to PA Incorporated. Coil apparatus mounted on an axially split spool for indicating wall thickness variations of a length of ferromagnetic pipe. 4,611,170, Cl. 324-229.000.

Stanwich Industries, Inc.: *See*—
Amos, James R.; Greathouse, Chester K.; and Riddle, David S., 4,610,582, Cl. 409-163.000.

Stark, Anton W.: *See*—
Hood, Leroy E.; Hunkapiller, Michael W.; Dreyer, William J.; Hewick, Rodney M.; and Stark, Anton W., 4,610,847, Cl. 422-102.000.

State of New Mexico: *See*—
Mickelson, Jim; and Winfield, Barbara L., 4,610,087, Cl. 30-147.000.

Ste Delsey: *See*—
Seynhaeve, Andre G., 4,610,333, Cl. 190-18.00A.

Steck, Warren F.: *See*—
Underhill, Edward W.; Wong, John W.; Palaniswamy, Pachagounder; Steck, Warren F.; and Chisholm, Melvin D., 4,610,876, Cl. 424-84.000.

Steeb, Jorg, to Wieland-Werke AG. Low-alloy (Ni-Sn-Ti) copper alloy. 4,610,843, Cl. 420-473.000.

Steele, Jerry T.: *See*—
Schwartz, Lawrence; Kilsdonk, Jan A.; and Steele, Jerry T., 4,610,496, Cl. 339-91.00B.

Steinebrunner, Walter, to Zahoransky, Anton. Apparatus for replenishing the supplies of bristles in the magazines of brush making machines. 4,610,481, Cl. 300-21.000.

Steinman, Kenneth. Fishing lure. 4,610,103, Cl. 43-17.600.

Steklenski, David J.; Upson, Donald A.; and Low, Howard M., to Eastman Kodak Company. Novel acrylonitrile copolymers. 4,611,027, Cl. 524-815.000.

Stemmildt, Hans-Joachim; and Nohren, Hubert, to Autoflug GmbH. Central lock for safety belts. 4,610,058, Cl. 24-574.000.

Stendel, Wilhelm: *See*—
Fuchs, Rainer; Hammann, Ingeborg; and Stendel, Wilhelm, 4,611,009, Cl. 514-521.000.
Marhold, Albrecht; Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Becker, Benedikt; Krehan, Ingomar; and Stendel, Wilhelm, 4,611,003, Cl. 514-452.000.

Stepan Company: *See*—
Rockwell, Ned M., 4,610,825, Cl. 260-410.500.

Sterimatics Company Limited Partnership: *See*—
Reti, Adrian R.; and Benn, James A., 4,610,790, Cl. 210-636.000.

Steritech B.V.: *See*—
Wolff-Mooij, Marcelle N., 4,610,469, Cl. 285-260.000.

Sterling Drug Inc.: *See*—
Bailey, Denis M., 4,610,991, Cl. 514-318.000.

Stern, Leif E. Waste container. 4,610,039, Cl. 4-285.000.

Steudler, Frederick W., Jr, to Val Products, Inc. Method for fabricating a watering system for fowl. 4,610,063, Cl. 29-157.00R.

Steudler, Frederick W., Jr., to Val Products, Inc. Nipple for feeding liquids to fowl and/or small animals. 4,610,221, Cl. 119-72.500.

Stewart Enterprises, Inc.: *See*—
Stewart, Jack D., 4,610,279, Cl. 140-105.000.

Stewart, Jack D., to Stewart Enterprises, Inc. Method and apparatus for cutting and bending resistor leads or the like. 4,610,279, Cl. 140-105.000.

Stillwell, Howard R.: *See*—
Anderson, John G.; and Stillwell, Howard R., 4,611,207, Cl. 340-870.160.

Stilwell, Fred W. Portable battery powered smoke detector and clock. 4,611,200, Cl. 340-628.000.

Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, to Ciba-Geigy Corporation. Polymers derived from N-cyanoacylamides. 4,611,041, Cl. 526-298.000.

Stoffler, Bernhard, to Vulkan-Werk Wilhelm Diebold. Checking and filling device for powder extinguishers. 4,610,283, Cl. 141-89.000.

Stolfi, Fred R.; and Shapiro, Paul J., to North American Philips Corporation. Long life vibration canceller having a gas spring. 4,610,143, Cl. 62-6.000.

Stolle Corporation, The: *See*—
Kaminski, Elton G.; and Hasselbeck, Richard J., 4,610,156, Cl. 72-431.000.

Stone, Patrick C.: *See*—
Mullins, Albert A., II; Stone, Patrick C.; and Ingram, Gary D., 4,610,300, Cl. 166-134.000.

Stone, Paul R., Jr. Power potentiating windmill. 4,611,125, Cl. 290-55.000.

Stone, Roger E.: *See*—
Asmuth, Richard L.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,094, Cl. 179-7.1TP.
Asmuth, Richard L.; DiCarlo-Cottone, Melchior J.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Raj-karne, Dattatraya G.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,096, Cl. 179-18.00B.

Stork Amsterdam B.V.: *See*—
van Schagen, Hans W.; Tewes, Johannes W.; and Goede, Rodolphe H., 4,610,298, Cl. 165-39.000.

Stout, Gregg W.: *See*—
Nelson, John A.; and Stout, Gregg W., 4,610,312, Cl. 175-4.520.

Stoutamire, Donald W.: *See*—
Dong, Walter; and Stoutamire, Donald W., 4,611,077, Cl. 558-351.000.

Strobel, Jean-Paul, to Cirtech S.A. Printed circuit board and process for its manufacture. 4,610,756, Cl. 156-645.000.

Strobl, Frederick T.: *See*—
Cohen, Daniel E.; and Strobl, Frederick T., 4,610,259, Cl. 128-731.000.

Strohbeen, David T.; and VanDeurzen, John I., to Kimberly-Clark Corporation. Disposable underpants having discrete outer seals. 4,610,681, Cl. 604-396.000.

Stroup, Bert R., to Arctic Temperature Controls. Cold weather breathing apparatus. 4,610,247, Cl. 128-201.280.

Stubbmann, Albert, to Clik-Cut, Inc. Frictional drag arrangement for sheet material dispenser. 4,610,407, Cl. 242-55.200.

Sturm, Elmar; Muller, Urs; and Tobler, Hans. Fluorinated azolyl ethanol growth regulators and microbicides. 4,610,716, Cl. 71-76.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Hauser, Kurt; and Hummel, Werner, 4,610,341, Cl. 192-58.00B.

Sueshige, Hiroshi: *See*—
Miyazawa, Takeshi; Sueshige, Hiroshi; Niikawa, Yutaka; and Shimokawa, Masahide, 4,610,335, Cl. 192-3.620.

Sugaya, Yoshio: *See*—
Asawa, Tatsuro; Miyake, Haruhisa; and Sugaya, Yoshio, 4,610,764, Cl. 204-98.000.

Sugihara, Toshihiko, to Kyoritsu Kikai Company. Shutter. 4,610,289, Cl. 160-35.000.

Sugimoto, Kouichi: *See*—
Hamada, Toyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; Jinriki, Tatenori; and Koizumi, Kiyohide, 4,610,598, Cl. 411-744.00A.

Suginoya, Mitsuru: *See*—
Kamamori, Hitoshi; Tsunoda, Yukiyoshi; Suginoya, Mitsuru; Sano, Yutaka; and Terada, Yumiko, 4,610,507, Cl. 350-335.000.

Sugioka, Yukio; and Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Weight measuring apparatus for elongated articles. 4,610,322, Cl. 177-25.000.

Sugishita, Junji: *See*—
Niwa, Shigeo; Sugishita, Junji; and Ishii, Masami, 4,610,693, Cl. 623-16.000.

Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, to Canon Kabushiki Kaisha. Liquid-jetting head. 4,611,219, Cl. 346-140.00R.

Sugiyama, Katsumi: *See*—
Yukawa, Toshihide; Ikeda, Toru; Kishimoto, Shinichi; and Sugiyama, Katsumi, 4,610,827, Cl. 260-501.110.

Sukawa, Hiroshi: *See*—
Yamamoto, Takakazu; Yamamoto, Sadaaki; Kobayashi, Sadao; and Sukawa, Hiroshi, 4,610,811, Cl. 252-511.000.

Sukenari, Junzo: *See*—
Eguchi, Jyutaro; Sukenari, Junzo; Kashino, Shinzo; Minami, Ryuichi; Odahara, Tetsuichi; and Iwashita, Masahiro, 4,610,127, Cl. 56-14.600.

Suko, Shouichi; and Hoshino, Hirohisa, to Iwatsu Electric Co., Ltd. Apparatus for analyzing microprocessor operation. 4,611,281, Cl. 364-200.000.

Sullivan, Donald F. Method for photographically improving the resolution of screen printed photopolymer images. 4,610,941, Cl. 430-6.000.

Sulzer-Escher Wyss AG: *See*—
Christ, Alfred; and Lehmann, Rolf, 4,610,617, Cl. 425-143.000.

Sumida, Shizuo: *See*—
Nobumoto, Kazutoshi; and Sumida, Shizuo, 4,610,183, Cl. 74-866.000.

Sumitomo Chemical Company, Limited: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Tanno, Norihiko; Sato, Hiromi; and Yoshida, Noboru, 4,610,986, Cl. 514-239.000.
Manabe, Akio; Hisada, Yoshio; and Furuzawa, Kunihiko, 4,610,997, Cl. 514-397.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kawauchi, Hiroshi; and Kyoto, Michihisa, 4,610,709, Cl. 65-3.120.
Miyazaki, Hideaki; Yamano, Yoshikazu; Saito, Yasunori; Okano, Mikihiko; and Nakano, Tsuneo, 4,610,503, Cl. 350-96.200.
Yazu, Shuji; and Nakamura, Tsutomu, 4,610,699, Cl. 51-309.000.

Summerville, Edward: *See*—
Baker, Bruce G.; Clark, Neville J.; McArthur, Hamish; and Summerville, Edward, 4,610,975, Cl. 502-302.000.

Sunds Defibrator Aktiebolag: *See*—
Sjobom, Axel H., 4,610,400, Cl. 241-261.200.

Sundstrand Corporation: *See*—
Blain, Edward S., 4,610,610, Cl. 418-14.000.
Blain, Edward S., 4,610,611, Cl. 418-55.000.
Nelson, Thomas, 4,610,265, Cl. 137-219.000.
Sutrina, Thomas, 4,611,137, Cl. 310-54.000.

Sundstrand Data Control, Inc.: *See*—
Butenko, R. Bruce; Sprague, Randall B.; and Bateman, Charles D., 4,611,304, Cl. 364-571.000.

Sunkist Growers, Inc.: *See*—
Miller, Dennis H.; and Mutka, Jerry R., 4,610,890, Cl. 426-651.000.

Superior Healthcare Group, Inc.: *See*—
Russo, Ronald D., 4,610,673, Cl. 604-270.000.

Sutrina, Thomas, to Sundstrand Corporation. Cooling of dynamoelectric machines. 4,611,137, Cl. 310-54.000.

Suwa, Kaname, to Canon Kabushiki Kaisha. Electronic equipment. 4,611,261, Cl. 361-399.000.

Suzuki, Haruo: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.

Suzuki, Katsumi: *See*—
Sasaki, Yuko; Suzuki, Katsumi; Minato, Akira; and Yoshida, Tomio, 4,610,732, Cl. 148-6.14R.

Suzuki, Kimio; Toda, Jitsuo; and Shimizu, Wataru, to Toshiba Kikai Kabushiki Kaisha. Apparatus and method in which a plurality of detectors generating signals with different periods are used to detect the absolute position of a moving member. 4,611,269, Cl. 364-174.000.

Suzuki, Masaki: *See*—
Oku, Kenichi; and Suzuki, Masaki, 4,610,442, Cl. 269-73.000.

Suzuki, Shigeyoshi: *See*—
Kanada, Eiji; Endo, Kazunaka; Yamamoto, Kyonosuke; and Suzuki, Shigeyoshi, 4,610,949, Cl. 430-301.000.

Suzuki, Shinichi: *See*—
Hayama, Akira; and Suzuki, Shinichi, 4,611,344, Cl. 381-108.000.

Suzuki, Shoji: *See*—
Kubota, Hitoshi; Otokuni, Tadaaki; Suzuki, Shoji; and Nakagawa, Keiji, 4,610,338, Cl. 192-13.00A.

Suzuki, Takashi; Matsuzaki, Makoto; Matsuzawa, Masanao; and Miyazawa, Yoshinori, to Seiko Epson Corporation. Ink composition and wire dot printer including same. 4,610,554, Cl. 400-124.000.

Suzuki, Tatsuo; and Matsumoto, Atsushi, to Terumo Kabushi Kaisha. Catheter introducing instrument. 4,610,674, Cl. 604-282.000.

Suzuki, Tatsuo: *See*—
Matsumoto, Atsushi; and Suzuki, Tatsuo, 4,610,665, Cl. 604-167.000.

Suzuki, Yasumichi: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.

Suzuki, Yasuyuki: *See*—
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.

Svensk Termo-Ekonomi AB: *See*—
Larsson, Arne, 4,610,434, Cl. 266-75.000.

Svensson, Kjell: *See*—
Lersten, Bjarne; and Svensson, Kjell, 4,610,208, Cl. 110-244.000.

Swann, Wayne E.: *See*—
Durham, Donald; Glick, J. Leslie; Fodge, Douglas W.; and Swann, Wayne E., 4,610,800, Cl. 252-174.120.

Swanson, Arthur P. Picture hanger. 4,610,419, Cl. 248-547.000.

Swanson, Eric J., to AT&T Bell Laboratories. Floating input comparator with precharging of input parasitic capacitors. 4,611,130, Cl. 307-355.000.

Swartzbaugh, Peter T., to Owens-Illinois, Inc. Self-sealing closure for small containers. 4,610,372, Cl. 220-288.000.

Swinney Engineering Limited: *See*—
Pearson, James A., 4,610,786, Cl. 210-236.000.

Swiss Aluminium Ltd.: *See*—
Bregenzer, Rene , 4,610,747, Cl. 156-322.000.
Brockmeyer, Jerry W., 4,610,832, Cl. 264-44.000.
Gold, Ernst; Tragner, Erich; and Lenz, Dieter, 4,610,070, Cl. 29-429.000.

Syntron, Inc.: *See*—
Woods, Theodore E., 4,611,171, Cl. 324-253.000.

Szarvas, Imre: *See*—
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Szatmari, Ferenc: *See*—
Gotz, Sandor; Krenedits, Sandor; and Szatmari, Ferenc, 4,611,268, Cl. 364-148.000.

Szecsenyi, Imre: *See*—
Dede, Laszlo; Dede nee Pal, Maria; Varga nee Varga, Terez; Barati, Peter; Szarvas, Imre; Fodor, Beno; Szecsenyi, Imre; Pap Szekeres, Jozsef; and Serester, Kalman, 4,610,814, Cl. 530-380.000.

Szymaszek, Paul G., to Vilter Manufacturing Corporation. Control means for gas compressor having dual slide valves. 4,610,613, Cl. 418-195.000.

Taber, James M.; and Kras, Stephen J., to Continental White Cap, Inc. Mold for closure cap. 4,610,621, Cl. 425-577.000.

Tachikawa, Osamu: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, 4,610,210, Cl. 112-121.120.

Tada, Satomi: *See*—
Kumasaka, Sadao; Tada, Satomi; Katsuki, Koretoshi; Nagamine, Ryoji; and Taniguchi, Hiroshi, 4,610,922, Cl. 428-304.400.

Tait, John A. R., to Wincanton Engineering Limited. Packaging of a block of cheese or other soft product. 4,610,885, Cl. 426-130.000.

Taiyo Yuden Co., Ltd.: *See*—
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,968, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,969, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,970, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,971, Cl. 501-137.000.

Tajima, Hatsuo: *See*—
Hayashi, Nobuhiro; Nakahata, Kimio; Tajima, Hatsuo; and Nakamura, Shunji, 4,610,531, Cl. 355-14.00D.

Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, to Toyama Chemical Co., Ltd. N-acyl acidic amino acid diamide derivative, a salt thereof, and an anti-ulcer agent containing the same. 4,610,983, Cl. 514-230.000.

Takagi, Kunihiko; Mochizuki, Masatsugu; Sakamoto, Izumi; and Teranishi, Hiroichi, to Unitika Ltd. Carriers for immobilization of physiologically active substances. 4,610,962, Cl. 435-179.000.

Takagi, Masao; and Watashi, Mitsuo, to Kubota, Ltd. Transmission for a tractor. 4,610,174, Cl. 74-15.200.

Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; Ohta, Kenji; and Yamaoka, Hideyoshi, to Sharp Kabushiki Kaisha. Magneto-optic memory element. 4,610,912, Cl. 428-213.000.

Takahashi, Kozo: *See*—
Kinashi, Hiroshi; and Takahashi, Kozo, 4,610,528, Cl. 355-3.0DD.

Takahashi, Masaaki: *See*—
Igarashi, Yuriko; and Takahashi, Masaaki, 4,610,927, Cl. 428-402.210.

Takahashi, Masazumi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for continuously hydrolyzing ethylene-vinyl acetate. 4,611,029, Cl. 525-61.000.

Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Brazing method of aluminum. 4,610,390, Cl. 228-207.000.

Takahashi, Takehiko: *See*—
Nakamura, Hiromi; Takahashi, Takehiko; Narazaki, Norio; Yamamoto, Kazuo; and Sayama, Norio, 4,610,137, Cl. 60-39.511.

Takahashi, Tomoyuki; Kato, Masashi; and Kikuchi, Hisashi, to Fuji Photo Film Co., Ltd. Film unit withdrawing apparatus. 4,610,520, Cl. 354-86.000.

Takahashi, Yasuhiro: *See*—
Ohara, Yoshio; Arai, Kazutaka; Takahashi, Yasuhiro; and Takakuwa, Yasuo, 4,611,088, Cl. 562-466.000.

Takahata, Naomi, to Canon Kabushiki Kaisha. Automatic document feeding device. 4,610,533, Cl. 355-14.0SH.

Takakuwa, Yasuo: *See*—
Ohara, Yoshio; Arai, Kazutaka; Takahashi, Yasuhiro; and Takakuwa, Yasuo, 4,611,088, Cl. 562-466.000.

Takano, Kunio: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, 4,610,210, Cl. 112-121.120.

Takao Ooi wa: *See*—
Ishida, Shoji, 4,611,102, Cl. 200-5.00R.

Takara Suzo Co., Ltd.: *See*—
Matsui, Susumu; Uchida, Satoko; and Taniguchi, Tsutomu, 4,610,963, Cl. 435-189.000.

Takase, Hidetomo, to Tokyo Shibaura Denki Kabushiki Kaisha. Reception signal processing apparatus in nuclear magnetic resonance diagnostic apparatus. 4,611,172, Cl. 324-314.000.

Takatani, Teruhiko: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,610,328, Cl. 180-140.000.

Takayama, Toshio: *See*—
Matsumoto, Yukio; and Takayama, Toshio, 4,610,483, Cl. 303-97.000.

Takayanagi, Takashi: *See*—
Fuchizawa, Tetsuro; Asao, Yasuzi; and Takayanagi, Takashi, 4,610,956, Cl. 430-538.000.

Takayasu, Teruko, to Showa Entetsu Co., Ltd. Immersion type electrode structure. 4,610,773, Cl. 204-285.000.

Takehara, Shin: *See*—
Fukushima, Masao; and Takehara, Shin, 4,610,420, Cl. 248-550.000.

Takenaka, Yuji, to Fuji Photo Film Co., Ltd. Color compensation method in photographic printer. 4,610,538, Cl. 355-69.000.

Takenaka, Yuji: *See*—
Kaneko, Rokusaburo; and Takenaka, Yuji, 4,610,539, Cl. 355-77.000.

Takeo, Kato: *See*—
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, 4,610,296, Cl. 164-469.000.

Takeuchi, Takashi: *See*—
Arai, Takao; Kobayashi, Masaharu; Takeuchi, Takashi; Okubo, Eiji; and Endoh, Hiroshi, 4,611,335, Cl. 375-110.000.

Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, to Olympus Optical Co. Ltd. Actuator operating center detecting circuit and optical disk apparatus with the detecting circuit. 4,611,316, Cl. 369-44.000.

Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, to Olympus Optical Co., Ltd. Optical disk apparatus. 4,611,317, Cl. 369-45.000.

Takiguchi, Takao; Miyazaki, Hajime; Matsumoto, Masakazu; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member contains disazo photoconductive compound. 4,610,943, Cl. 430-76.000.

Takizawa, Kazushige: *See*—
Shirai, Akira; Takizawa, Kazushige; Nishikawa, Yasuhisa; and Katoh, Tadayuki, 4,610,946, Cl. 430-278.000.

Takizawa, Masaaki: *See*—
Ohta, Yoshio; Kimura, Tadashi; Ijichi, Kiyoteru; and Takizawa, Masaaki, 4,610,421, Cl. 248-550.000.

Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Koike, Kazuyuki, to Fuji Photo Film Co., Ltd. Support of photographic paper. 4,610,924, Cl. 428-331.000.

Tamco Limited: *See*—
Collier, John D., 4,610,453, Cl. 280-5.00A.

Tamrac, Inc.: *See*—
Cyr, Jesselyn T., 4,610,286, Cl. 150-52.00J.

Tamura, Shigeru: *See*—
Tsuchida, Yoshihiro; Tamura, Shigeru; and Koda, Yoshio, 4,610,497, Cl. 339-176.00L.

Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, to Yamanouchi Pharmaceutical Co., Ltd. 4-substituted-2-azetidinone compound, process of producing the compounds, and medicaments containing the compounds. 4,610,821, Cl. 540-200.000.

Tanabe, Hiroshi: *See*—
Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00F.

Tanaka, Haruhiko: *See*—
Makabe, Hachiro; Tanaka, Haruhiko; and Kongoh, Takeshi, 4,610,211, Cl. 112-445.000.

Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, to Mitsubishi Denki Kabushiki Kaisha. Muffler for exhaust gas from internal combustion engine. 4,610,329, Cl. 181-265.000.

Tanaka, Hidehiko: *See*—
Machino, Katsuyuki; Ise, Masahiro; and Tanaka, Hidehiko, 4,611,274, Cl. 364-200.000.

Tanaka, Masashi, to Nippon Kogaku K.K. Objective lens for an optical disc. 4,610,515, Cl. 350-474.000.

Tanaka, Shunpei: *See*—
Imai, Masaharu; Tohukuji, Ikuo; Onitsuka, Osamu; Morita, Terumasa; Tanaka, Shunpei; and Matsui, Hiroshi, 4,611,221, Cl. 357-30.000.

Tanaka, Takashi: *See*—
Yashiki, Yuichi; and Tanaka, Takashi, 4,610,942, Cl. 430-58.000.

Tanaka, Tsuneo: *See*—
Haga, Kyosuke; Tanaka, Tsuneo; and Sakai, Toshifumi, 4,610,614, Cl. 418-269.000.

Tanberg, Dennis A., to Dow Chemical Company, The. System for testing chemicals before mixing them to avoid run-away reactions. 4,610,845, Cl. 422-51.000.

Tanca, Michael C.: *See*—
Darling, Scott L.; Tanca, Michael C.; and Thibeault, Paul R., 4,610,697, Cl. 48-77.000.

Tanemura, Yukio, to Nissan Motor Co., Ltd. Operating control device for air conditioner for use in vehicle. 4,610,146, Cl. 62-133.000.

Tani, Yoshio: *See*—
Nakano, Keiichi; Umeda, Tatsutoshi; and Tani, Yoshio, 4,610,227, Cl. 123-182.000.

Taniguchi, Hiroshi: *See*—
Kumasaka, Sadao; Tada, Satomi; Katsuki, Koretoshi; Nagamine, Ryoji; and Taniguchi, Hiroshi, 4,610,922, Cl. 428-304.400.

Taniguchi, Tsutomu: *See*—
Matsui, Susumu; Uchida, Satoko; and Taniguchi, Tsutomu, 4,610,963, Cl. 435-189.000.

Taniguti, Ryosuke, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting quantities of rotary member. 4,611,206, Cl. 340-870.110.

Tanimoto, Akikazu; and Imamura, Kazunori, to Nippon Kogaku K. K. Foreign substance inspecting apparatus. 4,610,541, Cl. 356-237.000.

Tanino, Tomoyasu: *See*—
Saito, Hiroshi; Nebu, Hideaki; Sakamoto, Tsuneaki; and Tanino, Tomoyasu, 4,610,230, Cl. 123-360.000.

Tannery, Reinhard G., to Federal-Mogul Corporation. Engine bearing height gage. 4,610,095, Cl. 33-517.000.

Tanno, Norihiko: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Tanno, Norihiko; Sato, Hiromi; and Yoshida, Noboru, 4,610,986, Cl. 514-239.000.

Tanno, Takao, to NEC Corporation. Digital non-addition mixing apparatus for video signals. 4,611,233, Cl. 358-160.000.

Tark, Sung Y.: *See*—
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,610,951, Cl. 430-313.000.

Tateishi, Hideki: *See*—
Saito, Hiroshi; Tateishi, Hideki; Kobayashi, Shigeru; Aiuchi, Susumu; Suzuki, Yasumichi; Sakata, Masao; Shimamura, Hideaki; and Kamei, Tsuneaki, 4,610,770, Cl. 204-192.100.

Tatemoto, Minoru: *See*—
Kumagai, Naotake; and Tatemoto, Minoru, 4,610,462, Cl. 280-707.000.

Taylor, Graham: *See*—
Jomes, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,611,014, Cl. 521-146.000.

Taylor, Paul. Infinitely variable transmission. 4,610,184, Cl. 74-794.000.

Taylor, Wilson E., Jr.; and Hand, Larry E., to Peavey Electronics Corp. Digital delay line. 4,611,300, Cl. 365-194.000.

Tazuke, Kazuo: *See*—
Setsune, Kentaro; Yamazaki, Osamu; Wasa, Kiyotaka; and Tazuke, Kazuo, 4,610,894, Cl. 427-53.100.

TDK Corporation: *See*—
Yagi, Hiroshi; and Harada, Yoshio, 4,610,280, Cl. 140-105.000.

Teac Corporation: *See*—
Shiroyama, Kazuhiko; Haraguchi, Tamotsu; and Sakai, Yoshiaki, 4,611,257, Cl. 360-104.000.

Technicon Instruments Corporation: *See*—
Intraub, Julius, 4,610,546, Cl. 366-110.000.

Teepak, Inc.: *See*—
Rop, Jaap; and Verboekend, Jacobus H. A., 4,610,742, Cl. 156-158.000.

Teijin Limited: *See*—
Kuratsuji, Taketoshi; and Miki, Tetsuro, 4,611,049, Cl. 528-279.000.

Tekken Construction Co., Ltd.: *See*—
Horimatsu, Kazuo, 4,610,572, Cl. 405-258.000.

Tektronix, Inc.: *See*—
Pederson, William K., Jr.; and Tils, John J., 4,611,092, Cl. 174-52.0PE.

Telectronics N.V.: *See*—
Ibrahim, Ibrahim H.; and Daly, Christopher N., 4,611,127, Cl. 307-116.000.

Teledyne Industries, Inc.: *See*—
Acker, Richard C., 4,610,270, Cl. 137-549.000.

Teleflex Incorporated: *See*—
Spease, Arthur L., 4,610,180, Cl. 74-501.00P.

Telefonaktiebolaget LM Ericsson: *See*—
Thurenius, Ake G. H.; and Vucins, Viesturs J., 4,610,504, Cl. 350-96.200.

Temelli, Sedat, to Mullverbrennungsanlage Wuppertal GmbH. Grate bar and grate tumbler for the tumbler grate of, e.g., a trash incineration installation or the like. 4,610,209, Cl. 110-276.000.

Tempel, Christel: *See*—
Nachbur, Hermann; and Tempel, Christel, 4,611,072, Cl. 556-135.000.

Teng, James; and Dokos, John H., to Anheuser-Busch Companies, Inc. Beer foam enhancing process and apparatus. 4,610,888, Cl. 426-569.000.

Ten Haagen, Christopher W., to General Electric Company. Auxiliary winding for driving electric meter accessories. 4,611,167, Cl. 324-137.000.

Terada, Yumiko: *See*—
Kamamori, Hitoshi; Tsunoda, Yukiyoshi; Suginoya, Mitsuru; Sano, Yutaka; and Terada, Yumiko, 4,610,507, Cl. 350-335.000.

Teranishi, Hiroichi: *See*—
Takagi, Kunihiko; Mochizuki, Masatsugu; Sakamoto, Izumi; and Teranishi, Hiroichi, 4,610,962, Cl. 435-179.000.

Terasaki Denki Sangyo Kabushiki Kaisha: *See*—
Murai, Wasaburo; and Yura, Takeshi, 4,611,188, Cl. 335-16.000.

Tersteegen, Bernd; and van Endert, Gunter. Hemodialysis system having a thermoinsulated container. 4,610,782, Cl. 210-137.000.

Terumo Kabushi Kaisha: *See*—
Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,610,674, Cl. 604-282.000.

Terumo Kabushiki Kaisha: *See*—
Matsumoto, Atsushi; and Suzuki, Tatsuo, 4,610,665, Cl. 604-167.000.

Tervol, Steven A., to General Motors Corporation. Fiberglass headliner with integral roof bows and roof rails. 4,610,478, Cl. 296-214.000.

Testa, William B. Vine trainer kit. 4,610,107, Cl. 47-47.000.

Tetra Pak International Aktiebolag: *See*—
Inoko, Kenji, 4,610,347, Cl. 198-425.000.

Teubler, Heinz: *See*—
Kruger, Heinz; Teubler, Heinz; Schulz, Rene ; and Staemmler, Erwin, 4,610,607, Cl. 417-292.000.

Tewari, Param H.; and Hunt, Arlon J., to United States of America, Energy. Process for forming transparent aerogel insulating arrays. 4,610,863, Cl. 423-338.000.

Tewes, Johannes W.: *See*—
van Schagen, Hans W.; Tewes, Johannes W.; and Goede, Rodolphe H., 4,610,298, Cl. 165-39.000.

Texas Instruments Incorporated: *See*—
Shah, Ashwin H., 4,611,131, Cl. 307-449.000.

Tezuka Kosan Kabushiki Kaisha: *See*—
Hasebe, Tsutomu, 4,610,368, Cl. 220-19.000.

Tezuka, Yoshitomo, to Tokyo Rope Manufacturing Co., Ltd. Concrete reinforcing steel fibers and production thereof. 4,610,926, Cl. 428-399.000.

Thacker, Louis H.: *See*—
Jatko, W. Bruce; McNeilly, David R.; and Thacker, Louis H., 4,611,176, Cl. 328-184.000.

Thadani, Suresh G.: *See*—
Bravenec, Frank R.; Hall, Hugh E., Jr.; Merchant, Gulamabbas A.; and Thadani, Suresh G., 4,611,173, Cl. 324-339.000.

Thayer, William L.: *See*—
Bennett, Adam J.; Capes, C. Edward; Thayer, William L.; and Toll, Floyd N., 4,610,547, Cl. 366-270.000.

Theeuwes, Felix: *See*—
Ayer, Atul; Theeuwes, Felix; and Wong, Patrick S. L., 4,610,686, Cl. 604-890.000.

Theobald, Hans: *See*—
Schwarz, Gerd-Ulrich; Theobald, Hans; and Adolphi, Heinrich, 4,611,010, Cl. 514-521.000.

Theodorsen, Theodore E., to Kurt Salmon Associates, Inc. Method and apparatus for making disposable shoe covers. 4,610,042, Cl. 12-142.00R.

Thermoz, Christian: *See*—
Duret, Francois; Duret nee Michallet, Elisabeth; and Thermoz, Christian, 4,611,288, Cl. 364-474.000.

Therolf, Dieter: *See*—
Schmidts, Klaus; Therolf, Dieter; and Weber, Ulrich, 4,610,618, Cl. 425-383.000.

Thibeault, Paul R.: *See*—
Darling, Scott L.; Tanca, Michael C.; and Thibeault, Paul R., 4,610,697, Cl. 48-77.000.

Thien, Gerhard: *See*—
Kirchweger, Karl; Knopf, Franz; and Thien, Gerhard, 4,610,326, Cl. 180-68.100.

Thomas, Leonard A., to General Electric Company. Polarized threaded lamp base. 4,610,498, Cl. 339-186.00R.

Thomas, Robert R.: *See*—
Palmquist, Ronald W.; and Thomas, Robert R., 4,611,331, Cl. 373-30.000.

Thomke, Ernst; and Muller, Jacques, to ETA S.A. Fabriques d'Ebauches. Watch having a case providing an integral bottom-plate structure. 4,610,550, Cl. 368-281.000.

Thompson, Albert E., Jr., to PPG Industries, Inc. Multiple-glazed combination vision and spandrel architectural panel and curtainwall. 4,610,115, Cl. 52-171.000.

Thompson, Randall, Jr. Tide activated generator. 4,610,140, Cl. 60-506.000.

Thomson-CSF: *See*—
Berger, Jean-Luc; Brissot, Louis; and Cazaux, Yvon, 4,611,234, Cl. 358-213.000.

Thomson, Michael A.: *See—*
Brooks, Graham L.; Pateman, Antony F.; Thomson, Michael A.; and Scott, John, 4,610,282, Cl. 141-46.000.
Thornblom, Jan: *See—*
Astner, Gunnar; Wstergren, Orjan; and Thornblom, Jan, 4,611,110, Cl. 219-121.0PY.
Thorson, Russell E.: *See—*
Sallee, Lorry F.; and Thorson, Russell E., 4,610,745, Cl. 156-244.110.
Thro, Stuart W.: *See—*
Engel, James R.; Bruckert, Eugene J.; and Thro, Stuart W., 4,611,334, Cl. 375-100.000.
Thurenius, Ake G. H.; and Vucins, Viesturs J., to Telefonaktiebolaget LM Ericsson. Fibre-optic switching means. 4,610,504, Cl. 350-96.200.
Tiegelmann, Gabriel: *See—*
Molander, Lance E.; Tiegelmann, Gabriel; and Kirhofer, Walter J., 4,610,492, Cl. 312-305.000.
Tieleman, Rudolf J.; and Ruesen, Ritsaert L. J. M., to Linco Holland Engineering B.V. Device for drawing the crop and gullet from slaughtered poultry. 4,610,050, Cl. 17-11.000.
Tiffany, John S., to Mentor Corporation. Rupture resistant prosthesis with bonded surface layer and method of forming same. 4,610,690, Cl. 623-8.000.
TII Computer Systems, Inc.: *See—*
Walter, Michael D.; and Grundtisch, Mark R., 4,611,101, Cl. 179-175.30R.
Tils, John J.: *See—*
Pederson, William K., Jr.; and Tils, John J., 4,611,092, Cl. 174-52.0PE.
Tindall, Colin: *See—*
Gibson, Stanley; and Tindall, Colin, 4,610,297, Cl. 165-9.000.
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Mode change-over device for pre-winding type camera. 4,610,522, Cl. 354-173.100.
Tobler, Hans: *See—*
Sturm, Elmar; Muller, Urs; and Tobler, Hans, 4,610,716, Cl. 71-76.000.
Toda, Jitsuo: *See—*
Suzuki, Kimio; Toda, Jitsuo; and Shimizu, Wataru, 4,611,269, Cl. 364-174.000.
Togashi, Seigo: *See—*
Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00F.
Tohukuji, Ikuo: *See—*
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Tokai Denka Kogyo Kabushiki Kaisha: *See—*
Fujiyasu, Koichiro; Yoneyama, Shigeki; and Ito, Haruhiko, 4,610,802, Cl. 252-188.200.
Tokico Ltd.: *See—*
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Tokunaga, Hiroshi: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, 4,610,210, Cl. 112-121.120.
Tokunaga, Toshihide; and Kato, Masaaki, to Hitachi Cable, Ltd. Single polarization optical fibers. 4,610,506, Cl. 350-96.330.
Tokuse, Masahiro: *See—*
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, 4,610,917, Cl. 428-224.000.
Tokyo Juki Industrial Co., Ltd: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, 4,610,210, Cl. 112-121.120.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Hashimoto, Koichiro; Yamamoto, Shirushi; Nakane, Hisashi; and Yokota, Akira, 4,610,953, Cl. 430-331.000.
Tokyo Rope Manufacturing Co., Ltd.: *See—*
Tezuka, Yoshitomo, 4,610,926, Cl. 428-399.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Nakayama, Yoshio; Abe, Fuminori; and Nagasawa, Naofumi, 4,611,135, Cl. 307-572.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
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Ohuchi, Kazunori; Ogura, Mitsugi; and Natori, Kenji, 4,611,237, Cl. 357-71.000.
Takase, Hidetomo, 4,611,172, Cl. 324-314.000.
Toll, Floyd N.: *See—*
Bennett, Adam J.; Capes, C. Edward; Thayer, William L.; and Toll, Floyd N., 4,610,547, Cl. 366-270.000.
Tomita, Sumio. Device for sealing coin containing bag or the like. 4,610,053, Cl. 24-30.50R.
Tomitaka, Kichinojyo: *See—*
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, 4,610,833, Cl. 264-235.800.
Tomlinson, Robert K., to Monier Limited. Mixer. 4,610,545, Cl. 366-2.000.
Tomy Kogyo Co. Inc.: *See—*
Ferguson, Edward, 4,610,637, Cl. 446-237.000.
Iwao, Noriaki; and Katsumata, Fuyuki, 4,610,638, Cl. 446-241.000.
Torigoe, Masaaki; Inagaki, Yoshio; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,610,954, Cl. 430-445.000.
Torr Vacuum Products, Inc.: *See—*
Norman, Arthur E., 4,610,603, Cl. 417-154.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Morino, Ichiro, 4,610,423, Cl. 251-25.000.
Suzuki, Kimio; Toda, Jitsuo; and Shimizu, Wataru, 4,611,269, Cl. 364-174.000.
Totsuka, Masao: *See—*
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Towae, Friedrich: *See—*
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Toyama Chemical Co., Ltd.: *See—*
Takagawa, Noboru; Hirai, Shiro; Kodama, Takuya; Hirano, Hiroshi; Kiba, Yasuo; Kawabata, Mikio; Miyaura, Tatsuya; and Suzuki, Yasuyuki, 4,610,983, Cl. 514-230.000.
Toyo Tire and Rubber Co., Ltd.: *See—*
Kan, Masanori; and Fujiwara, Hideo, 4,611,030, Cl. 525-99.000.
Toyo Unpanki Co., Ltd.: *See—*
Kameshita, Ryutaro, 4,610,178, Cl. 74-335.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Haga, Kyosuke; Tanaka, Tsuneo; and Sakai, Toshifumi, 4,610,614, Cl. 418-269.000.
Toyota Jidosha K.K.: *See—*
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,336, Cl. 192-4.00A.
Kuwayama, Yoshinari; Miura, Masakatsu; and Morisawa, Kunio, 4,610,337, Cl. 192-4.00A.
Toyota Jidosha Kabushiki Kaisha: *See—*
Fujita, Hiroya, 4,610,224, Cl. 123-90.310.
Ogawa, Masahiro; and Abe, Susumu, 4,610,857, Cl. 423-335.000.
Ohta, Yoshio; Kimura, Tadashi; Ijichi, Kiyoteru; and Takizawa, Masaaki, 4,610,421, Cl. 248-550.000.
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Nakamura, Kazuharu; Nakanishi, Yutaka; and Hisada, Yoshiaki, 4,610,239, Cl. 126-96.000.
Tragner, Erich: *See—*
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Tri-Bolt Fasteners ApS: *See—*
Bredal, Torben, 4,610,589, Cl. 411-180.000.
Trias, John, to United States of America, Navy. Real-time ultra-high resolution image projection display using laser-addressed liquid crystal light valve. 4,611,245, Cl. 358-235.000.
Triner, James E., to Gould, Inc. Method of fabricating battery plates for electrochemical cells. 4,610,081, Cl. 29-623.100.
Triunfol, David. Device for collecting fluid discharged from female organs. 4,610,675, Cl. 604-329.000.
Trouvay & Cauvin S.A.: *See—*
Besnard, Henri; and Fremau, Daniel, 4,610,430, Cl. 251-327.000.
Truner, Uwe D., to E. R. Squibb & Sons, Inc. Hydrazide derivatives of monocyclic beta-lactam antibiotics. 4,610,824, Cl. 540-355.000.
TRW Inc.: *See—*
Harrington, Alan L.; and Rodov, Vladimir, 4,610,730, Cl. 148-1.500.
Van Buren, Harold S., Jr.; and Hammerle, Frederick A., 4,610,588, Cl. 411-173.000.
Tsahalis, Demosthenes T., to Shell Oil Company. High current diversionary oil-boom. 4,610,794, Cl. 210-776.000.
Tsai, Kuo-Lung. Writing instrument with plural tips. 4,610,556, Cl. 401-18.000.
Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Operation control mechanism for camera. 4,610,523, Cl. 354-195.100.
Tsuchida, Yoshihiro; Tamura, Shigeru; and Koda, Yoshio, to Nippon Seiki Kabushiki Kaisha. Lamp socket device. 4,610,497, Cl. 339-176.00L.
Tsujimura, Fumio, to Clarion Co., Ltd. Ejection mechanism for a tape recorder. 4,611,256, Cl. 360-96.600.
Tsukakoshi, Osamu: *See—*
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Tsunoda, Yukiyoshi: *See—*
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Tu, Charles W.: *See—*
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Tubergen, Timothy S.; and Benjamin, Terrell A., to Shipley Company Inc. Process for metallizing plastics. 4,610,895, Cl. 427-98.000.
Tungsram Reszvenytarsasag: *See—*
Czeiler, Andras; Keri, Miklos; Balogh, Bela; Fejes, Erno ; Kallai, Istvan; and Lukacs, Sandor, 4,610,217, Cl. 118-47.000.
Turunen, Johannes: *See—*
Kaila, Ermo; Kinanen, Anita; Levon, Kalle; Turunen, Johannes; Osterholm, Jan-Erik; and Lindberg, J. Johan, 4,610,809, Cl. 252-500.000.
UBE Industries: *See—*
Mihara, Takeshi, 4,610,831, Cl. 264-40.700.
Ube Industries, Ltd.: *See—*
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, 4,610,917, Cl. 428-224.000.

Uchida, Satoko: *See*—
Matsui, Susumu; Uchida, Satoko; and Taniguchi, Tsutomu, 4,610,963, Cl. 435-189.000.
Uchikawa, Fusaoki: *See*—
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Ueda, Seiji, to Matsushita Electronics Corporation. Method of manufacturing an insulated gate field effect transistor. 4,610,076, Cl. 29-571.000.
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Machida, Toyotaka; Ueguri, Shigeharu; Matsumoto, Hiroaki; Nakamura, Akira; and Shinyagaito, Tatsuya, 4,611,228, Cl. 358-149.000.
Umeda, Tatsutoshi: *See*—
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Underhill, Edward W.; Wong, John W.; Palaniswamy, Pachagounder; Steck, Warren F.; and Chisholm, Melvin D., to Canadian Patents & Development Limited. Attractants for fall cankerworm moths. 4,610,876, Cl. 424-84.000.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,610,643, Cl. 464-143.000.
Union Camp Corporation: *See*—
Hayes, Kathryn S.; Frihart, Charles R.; and Wroczynski, Ronald J., 4,611,051, Cl. 528-295.300.
Union Carbide Corporation: *See*—
Goddard, Errol D.; Leung, Pak S.; and Mohr, Paul H., 4,610,222, Cl. 123-41.420.
Maresca, Louis M., 4,611,033, Cl. 525-419.000.
Miller, William C.; Dunne, Stephen R.; and Ausikaitis, Joseph P., 4,610,700, Cl. 55-35.000.
Nowotarski, Mark S., 4,610,391, Cl. 228-219.000.
Savich, Peter P., 4,610,653, Cl. 493-470.000.
Skeels, Gary W.; Breck, Donald W., deceased; and Blass, Harold, executor, 4,610,856, Cl. 423-328.000.
Union Oil Company of California: *See*—
Harbolt, Bruce; Murata, Perry L.; and Burmaster, Neal C., 4,610,714, Cl. 71-28.000.
Ward, John W., 4,610,973, Cl. 502-65.000.
Uniroyal Plastics Company, Inc.: *See*—
Schrock, Fredric L., 4,610,923, Cl. 428-304.400.
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Air Force: *See*—
Bennett, R. James, 4,611,210, Cl. 343-359.000.
Chern, Mao-Jin; and Smith, Ronald T., 4,610,499, Cl. 350-3.700.
Kane, Jerry A.; and Smith, Winthrop W., Jr., 4,611,208, Cl. 343-5.0CM.
Schneider, Richard T., 4,611,124, Cl. 250-578.000.
Army: *See*—
Bentley, James H., 4,611,142, Cl. 313-30.000.
Campbell, Donn V.; Dubowicz, Palemon W.; and Schwering, Felix, 4,611,214, Cl. 343-790.000.
Glendinning, William B., 4,610,948, Cl. 430-296.000.
Konig, Charles E.; and Skudera, William J., Jr., 4,611,194, Cl. 340-347.0SH.
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Hatch, George L.; Brummond, William A.; and Barrus, Donald M., 4,611,147, Cl. 313-550.000.
Jatko, W. Bruce; McNeilly, David R.; and Thacker, Louis H., 4,611,176, Cl. 328-184.000.
Schmidt, Frederick; and Carlson, O. Norman, 4,610,720, Cl. 75-84.000.
Tewari, Param H.; and Hunt, Arlon J., 4,610,863, Cl. 423-338.000.
National Aeronautics and Space Administration: *See*—
Barrett, Charles A.; and Lowell, Carl E., 4,610,736, Cl. 148-429.000.
Navy: *See*—
Clavell, Cesar, Jr., 4,610,169, Cl. 73-863.120.
Trias, John, 4,611,245, Cl. 358-235.000.
Whitlock, Robert R.; and Papanicolaou, Nicolas A., 4,611,140, Cl. 310-313.00B.
U.S. Philips Corporation: *See*—
Becker, Johann A.; Wirth, Helmut; and Zell, Werner, 4,610,505, Cl. 350-96.230.
Broer, Dirk J.; and Finck, Johan C. J., 4,610,746, Cl. 156-275.500.
Buhse, Ulf H.; and Kuhn, Hans-Jurgen, 4,611,226, Cl. 358-144.000.
Camens, Murray I. C., 4,611,160, Cl. 320-2.000.
Dolizy, Pierre; Groliere, Francoise; and Maniguet, Francois, 4,611,114, Cl. 250-211.00R.
Germi, Franco; and Moretti, Franco, 4,610,375, Cl. 222-131.000.
Giacometti, Alberto M.; Gruijs, Hans; and DeVries, Coos, 4,611,324, Cl. 370-97.000.
Khoe, Giok D.; and Nicia, Antonius J. A., 4,610,757, Cl. 156-655.000.
Klages, Claus P., 4,610,759, Cl. 156-662.000.
Kommoss, Klaus; Klos, Karl; Dietz, Hans W.; and Koppeler, Thomas H. W., 4,611,254, Cl. 360-69.000.
Nicia, Antonius J. A.; and Khoe, Giok D., 4,610,502, Cl. 350-96.120.
Riemersma, Pieter, 4,610,085, Cl. 30-90.000.
Schijven, Lucas W. M., 4,611,258, Cl. 360-105.000.
Van de Leest, Renaat E., 4,610,933, Cl. 428-627.000.
United States Surgical Corporation: *See*—
Green, David T., 4,610,250, Cl. 128-334.00C.
United Technologies Automotive, Inc.: *See*—
Wood, Richard D., 4,610,468, Cl. 285-81.000.
United Technologies Corporation: *See*—
Eaton, Harry E.; Novak, Richard C.; and Matarese, Alfred P., 4,610,698, Cl. 51-295.000.
Glomb, Walter L., Jr.; and Waters, James P., 4,610,274, Cl. 137-828.000.
Veltri, Richard D.; and Galasso, Francis S., 4,610,896, Cl. 427-140.000.
Vicki, Frank J.; and Shimizu, Setsuo, 4,610,157, Cl. 73-1.00R.
Unitika Ltd.: *See*—
Takagi, Kunihiko; Mochizuki, Masatsugu; Sakamoto, Izumi; and Teranishi, Hiroichi, 4,610,962, Cl. 435-179.000.
Universal Industrial Products Co., a Div. of Core Industries, Inc.: *See*—
Bolger, Robert M.; and Marko, Neil L., 4,610,129, Cl. 56-17.500.
University of Kentucky Research Foundation, The: *See*—
Kadaba, Pankaja K., 4,610,994, Cl. 514-340.000.
University of Medicine and Dentistry of New Jersey: *See*—
Rosenberg, Norman, 4,610,248, Cl. 128-325.000.
University of Pittsburgh: *See*—
Mickle, Marlin H.; and Pulyer, Yuly M., 4,610,172, Cl. 74-5.460.
University of Southern California: *See*—
Markland, Francis S., Jr.; and Reddy, Nagendranath K., 4,610,879, Cl. 424-94.000.
University of Tennessee Research Corporation, The: *See*—
Israel, Mervyn; and Seshadri, Ramakrishnan, 4,610,977, Cl. 514-34.000.
UOP Inc.: *See*—
Urban, Peter; and Hilfman, Lee, 4,610,776, Cl. 208-418.000.
Upjohn Company, The: *See*—
Sih, John C., 4,611,059, Cl. 546-274.000.
Upson, Donald A.: *See*—
Steklenski, David J.; Upson, Donald A.; and Low, Howard M., 4,611,027, Cl. 524-815.000.
Urban, Peter; and Hilfman, Lee, to UOP Inc. Coal liquefaction process. 4,610,776, Cl. 208-418.000.
Urschel, Joe R.: *See*—
Fischer, Robert R.; and Urschel, Joe R., 4,610,397, Cl. 241-86.000.
Urschel Laboratories Incorporated: *See*—
Fischer, Robert R.; and Urschel, Joe R., 4,610,397, Cl. 241-86.000.
Ushiro, Tatsuzo; Narasawa, Takashi; Fujiki, Makoto; and Edakubo, Hiroo, to Canon Kabushiki Kaisha. Rotating head assembly. 4,611,255, Cl. 360-84.000.
Utah Medical Products, Inc.: *See*—
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Utsumi, Shigeo: *See*—
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, 4,610,833, Cl. 264-235.800.
Uttscheid, Georg. Positioning device for the trolleys of an electric overhead trolley conveyor. 4,610,207, Cl. 104-256.000.
Vachta, Jindrich: *See*—
Gold-Aubert, Philippe; Melkonian, Diran; Vachta, Jindrich; Valter, Karel; Siegfried, Bernard; and Hugentobler, Stephane, 4,611,057, Cl. 544-301.000.
Vaillancourt, Vincent L., to MANRESA, Inc. Suction needle. 4,610,683, Cl. 604-405.000.
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Steudler, Frederick W., Jr., 4,610,221, Cl. 119-72.500.
Valter, Karel: *See*—
Gold-Aubert, Philippe; Melkonian, Diran; Vachta, Jindrich; Valter, Karel; Siegfried, Bernard; and Hugentobler, Stephane, 4,611,057, Cl. 544-301.000.
Valyocsik, Ernest W.; and Derouane, Eric G., to Mobil Oil Corporation. Synthesis of zeolite ZSM-14. 4,610,855, Cl. 423-328.000.
Van Becelaere, Robert M., to Philips Industrial Components, Inc. Damper blade construction. 4,610,197, Cl. 98-110.000.
Van Buren, Harold S., Jr.; and Hammerle, Frederick A., to TRW, Inc. Fastener clip. 4,610,588, Cl. 411-173.000.
Van Camp, John; and Baran, Stanley J., to Proctor & Schwartz, Inc. Reactor for dry flue gas desulfurization. 4,610,849, Cl. 422-111.000.
Van de Leest, Renaat E., to U.S. Philips Corporation. Duplication master suitable for the manufacture of electroplated copies. 4,610,933, Cl. 428-627.000.
VanDeurzen, John I.: *See*—
Strohbeen, David T.; and VanDeurzen, John I., 4,610,681, Cl. 604-396.000.
Van Doorn, Donald W.; Hawkins, James B.; Harmon, William A.; McKenzie, Terry L.; and Hollingsworth, Michael A., to Lummus Industries, Inc. Apparatus for removing quantities of fiber from bales for blending purposes and the like. 4,610,575, Cl. 406-113.000.
van Endert, Gunter: *See*—
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Van Gils, Gerard J.; and Shorr, Jacob, to Memtek Corporation. Membrane filtration process. 4,610,792, Cl. 210-639.000.
Vannesjo, Katarina L., to AB Asea-Atom. Fuel rod for a nuclear reactor. 4,610,842, Cl. 376-416.000.
van Schagen, Hans W.; Tewes, Johannes W.; and Goede, Rodolphe H., to Stork Amsterdam B.V. Process and installation for applying a

controllable heat-exchange in regenerative heat-exchanger. 4,610,298, Cl. 165-39.000.
Vantouroux, Patrick, to Compagnie Deutsch. Device for guiding and locking the coupling of a connector. 4,610,564, Cl. 403-316.000.
Vapor Corporation: *See—*
Reddy, Redreddy S., 4,611,104, Cl. 200-43.080.
Vaportek, Inc.: *See—*
Bryson, John D., 4,610,394, Cl. 239-57.000.
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Varghese, Philip, to Mobil Oil Corporation. Coal liquefaction with Mn nodules. 4,610,777, Cl. 208-417.000.
Varian Associates, Inc.: *See—*
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Vaw-Folien-Verarbeitung GmbH: *See—*
Massott, Philipp; and Leonhardt, Heinz, 4,610,367, Cl. 215-252.000.
VDO Adolf Schindling AG: *See—*
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Veaux, Jacques; Dubos, Jean-Michel; and Woerner, Pierre, to Messier-Hispano-Bugatti (S.A.). Steerable aircraft landing gear having automatic safety declutching and enclutching. 4,610,411, Cl. 244-50.000.
VEB Werk fur Fernsehelektronik im VEB Kombinat Mikroelektronik: *See—*
Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, 4,610,805, Cl. 252-299.620.
Veltri, Richard D.; and Galasso, Francis S., to United Technologies Corporation. Method for repairing a multilayer coating on a carbon-carbon composite. 4,610,896, Cl. 427-140.000.
Verboekend, Jacobus H. A.: *See—*
Rop, Jaap; and Verboekend, Jacobus H. A., 4,610,742, Cl. 156-158.000.
Verhoeven, Thomas R.: *See—*
Volante, Ralph P.; Verhoeven, Thomas R.; Sletzinger, Meyer; McNamara, James M.; Liu, Thomas M. H.; and Corley, Edward G., 4,611,067, Cl. 549-292.000.
Verlinden, Willy G.: *See—*
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,610,532, Cl. 355-14.00D.
Verstraeten, Paul F. M., to 501 Peinemann Equipment B.V. Device for spreading flanges. 4,610,064, Cl. 29-239.000.
Vesperman, William C.: *See—*
Kiersarsky, Albert S.; Sauer, Earl S.; Vesperman, William C.; and Wilson, Max K., 4,610,909, Cl. 428-202.000.
Veth, George J., to Food Automation-Service Techniques, Inc. Header assembly for deep fat frying cooking system. 4,610,238, Cl. 126-21.00R.
Vezjak, William. Oral hygiene brush. 4,610,043, Cl. 15-111.000.
Vickers Public Limited Company: *See—*
Brockway, Brian R., 4,610,570, Cl. 405-224.000.
Vickers Systems GmbH: *See—*
Kruger, Heinz; Teubler, Heinz; Schulz, Rene ; and Staemmler, Erwin, 4,610,607, Cl. 417-292.000.
Vickers Systems S.A.: *See—*
Balmer, Clifford J.; and Goddard, Richard, 4,610,271, Cl. 137-596.130.
Vicki, Frank J.; and Shimizu, Setsuo, to United Technologies Corporation. Surface penetrant inspection test piece having varying thickness plating. 4,610,157, Cl. 73-1.00R.
Victor Company of Japan, Limited: *See—*
Hishiki, Hideo; and Kamiyama, Yukio, 4,611,152, Cl. 315-411.000.
Honjo, Yoshihiko; Yamada, Hisayoshi; Hosono, Kazuhiro; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,611,248, Cl. 358-342.000.
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, 4,611,217, Cl. 346-76.0PH.
Machida, Toyotaka; Ueguri, Shigeharu; Matsumoto, Hiroaki; Nakamura, Akira; and Shinyagaito, Tatsuya, 4,611,228, Cl. 358-149.000.
Viertel, Lothar: *See—*
Ebert, Charles; and Viertel, Lothar, 4,610,443, Cl. 296-97.00H.
Ebert, Charles; Viertel, Lothar; Lecorvaisier, Rene ; and Menschaert, Joseph, 4,610,477, Cl. 296-97.00K.
Vilter Manufacturing Corporation: *See—*
Kocher, Erich J., 4,610,612, Cl. 418-195.000.
Szymaszek, Paul G., 4,610,613, Cl. 418-195.000.
Vinot, Daniel R., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. Device for superimposition of the successive stages of the transfer of data among several data processing units. 4,611,276, Cl. 364-200.000.
Vischer, Axel: *See—*
Musch, Rudiger; Nuyken, Oskar; Pask, Stephen D.; Vischer, Axel; and Walter, Michael, 4,611,037, Cl. 526-135.000.
Vivian, Roy H.: *See—*
Brockhurst, David M.; Vivian, Roy H.; Dyer, Martyn R.; and Day, Stephen, 4,611,227, Cl. 358-147.000.
Voest-Alpine Internation Corporation: *See—*
Langeder, Rudolf, 4,610,586, Cl. 409-300.000.
Voisin, Eugene, to Institut Textile de France. Device for holding a textile article in the course of treatment. 4,610,379, Cl. 226-42.000.
Volante, Ralph P.; Verhoeven, Thomas R.; Sletzinger, Meyer; McNamara, James M.; Liu, Thomas M. H.; and Corley, Edward G., to Merck & Co., Inc. Process for the preparation of HMG-CoA reductase inhibitors and intermediate compounds employed therein. 4,611,067, Cl. 549-292.000.
Volante, Ralph P.: *See—*
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., 4,611,081, Cl. 560-53.000.
Volk, Alfei F., deceased: *See—*
Kazak, Vadim N.; Kapralov, Valery K.; and Volk, Alfei F., deceased, 4,610,303, Cl. 166-251.000.
Volk, Igor F., administrator: *See—*
Kazak, Vadim N.; Kapralov, Valery K.; and Volk, Alfei F., deceased, 4,610,303, Cl. 166-251.000.
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., to NJM, Inc. Literature applying mechanism. 4,610,753, Cl. 156-552.000.
von Blucher, Hasso: *See—*
von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 4,610,905, Cl. 428-90.000.
von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest. Yarn having specific properties. 4,610,905, Cl. 428-90.000.
Vorwerk & Co. Interholding GmbH: *See—*
Helmes, Ludger; and Kramer, Rolf-Jurgen, 4,610,340, Cl. 192-56.00R.
Voss, Peter; and Osburg, Dieter, to Jagenberg AG. Device for conveying and stacking sheets of paper. 4,610,593, Cl. 414-43.000.
Vrinssen, Cornelis H.; van Gennen, Albert A.; and Bongers, Jozef J. M., to Stamicarbon B.V. Process for the preparation of a nylon block copolymer with mixture of high molecular weight activator reactant and low molecular weight activator reactant. 4,611,052, Cl. 528-312.000.
Vsesojuznoe Nauchno-Proizvod Stvennoe Obiedinenie "Sojuzpromgaz": *See—*
Kazak, Vadim N.; Kapralov, Valery K.; and Volk, Alfei F., deceased, 4,610,303, Cl. 166-251.000.
Vucins, Viesturs J.: *See—*
Thurenius, Ake G. H.; and Vucins, Viesturs J., 4,610,504, Cl. 350-96.200.
Vulkan-Werk Wilhelm Diebold: *See—*
Stoffler, Bernhard, 4,610,283, Cl. 141-89.000.
W. C. Heraeus GmbH: *See—*
Ernst, Volker; and Opower, Hans, 4,611,329, Cl. 372-88.000.
W. R. Grace KK: *See—*
Milliken, Robert D., 4,610,950, Cl. 430-306.000.
W. Schlafhorst & Co.: *See—*
Busch, Dieter; and Sannig, Ulrich, 4,610,134, Cl. 57-417.000.
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,610,132, Cl. 57-22.000.
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Wada, Minoru: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Wada, Minoru; Tachikawa, Osamu; and Tokunaga, Hiroshi, 4,610,210, Cl. 112-121.120.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Low temperature sintered ceramic material for use in solid dielectric capacitors or the like, and method of manufacture. 4,610,968, Cl. 501-137.000.
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Wagner Folding Box Corp.: *See—*
Schwartz, Arthur; and Scott, Paul O., 4,610,349, Cl. 206-175.000.
Wajima, Motoyo: *See—*
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Wakamiya, Katsutoshi: *See—*
Matsumoto, Toru; Yamazaki, Masuo; and Wakamiya, Katsutoshi, 4,610,944, Cl. 430-135.000.
Walker, Clarence E., Jr.: *See—*
Craig, Daniel E.; Walker, Clarence E., Jr.; and Wilbur, Leonard P., Jr., 4,610,636, Cl. 445-68.000.
Walker, John G., to Young & Thompson. Pressure sensing on rigid sails. 4,610,213, Cl. 114-102.000.
Wallace, William D., to Utah Medical Products, Inc. Pressure transducer. 4,610,256, Cl. 128-675.000.
Walsh, A. Lee: *See—*
Jones, Leo V., Jr.; and Walsh, A. Lee, 4,611,325, Cl. 370-110.300.
Walsh, John M.: *See—*
Dunne, Brian B.; and Walsh, John M., 4,610,204, Cl. 102-476.000.
Walsh, Patrick C.: *See—*
Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., 4,610,249, Cl. 128-328.000.
Walsh, Robert B.: *See—*
Halen, Richard M.; and Walsh, Robert B., 4,610,471, Cl. 285-337.000.

Walter, Jurgen: *See*—
Falz, Ulrich; Lunke, Manfred; and Walter, Jurgen, 4,610,642, Cl. 464-69.000.

Walter, Lothar; Brandenstein, Manfred; and Olschewski, Armin, to Skf Kugellagerfabriken GmbH. Roller, especially a tension roller for a belt drive. 4,610,646, Cl. 474-198.000.

Walter, Michael: *See*—
Musch, Rudiger; Nuyken, Oskar; Pask, Stephen D.; Vischer, Axel; and Walter, Michael, 4,611,037, Cl. 526-135.000.

Walter, Michael D.; and Grundtisch, Mark R., to TII Computer Systems, Inc. Method and apparatus for testing communication systems. 4,611,101, Cl. 179-175.30R.

Walter, Thomas H. Telescoping container assembly. 4,610,358, Cl. 206-514.000.

Wang, Lin-Shu. Compound engine with plural stage intercooled exhaust pump. 4,610,141, Cl. 60-614.000.

Ward, Jay A. Oil/water separating system. 4,610,788, Cl. 210-242.300.

Ward, John W., to Union Oil Company of California. Hydrocarbon conversion catalyst. 4,610,973, Cl. 502-65.000.

Warner & Swasey Company, The: *See*—
Bell, Frederick K.; and Raleigh, Freddie L., 4,610,089, Cl. 33-1.00M.

Wasa, Kiyotaka: *See*—
Setsune, Kentaro; Yamazaki, Osamu; Wasa, Kiyotaka; and Tazuke, Kazuo, 4,610,894, Cl. 427-53.100.

Wasamoto, Katsuyo: *See*—
Yamashita, Osamu; Moriyama, Noboru; Ootani, Shoji; and Wasamoto, Katsuyo, 4,611,087, Cl. 560-81.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Thermal head positioning apparatus with ribbon cassette. 4,611,218, Cl. 346-76.0PH.

Watanabe, Koichi: *See*—
Ito, Takehiko; Irie, Taisuke; Nakagawa, Yoshitaka; and Watanabe, Koichi, 4,610,937, Cl. 428-659.000.

Watanabe, Kozo; and Kawada, Masashi, to Yoshida Kogyo K. K. Method of bundling elongate articles. 4,610,124, Cl. 53-399.000.

Watanabe, Namio, to Akebono Brake Industry Company Ltd. Antilock system for air brake system. 4,610,485, Cl. 303-114.000.

Watanabe, Toshio: *See*—
Naito, Mitsuo; and Watanabe, Toshio, 4,610,490, Cl. 312-272.000.

Watanabe, Yasuo: *See*—
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, 4,610,296, Cl. 164-469.000.

Watanabe, Yoshio: *See*—
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,611,148, Cl. 313-595.000.

Watashi, Mitsuo: *See*—
Takagi, Masao; and Watashi, Mitsuo, 4,610,174, Cl. 74-15.200.

Waters, James P.: *See*—
Glomb, Walter L., Jr.; and Waters, James P., 4,610,274, Cl. 137-828.000.

Wayne Boren Corporation: *See*—
Linscott, John D., 4,610,901, Cl. 428-38.000.

Weasler Engineering, Inc.: *See*—
Mayhew, Roger D.; and Reak, B. Bennett, 4,610,559, Cl. 403-23.000.

Weber, Klaus, to Weber und Springmann. Device for the dosable addition of a substance to a solvent. 4,610,848, Cl. 422-106.000.

Weber, Ulrich: *See*—
Schmidts, Klaus; Therolf, Dieter; and Weber, Ulrich, 4,610,618, Cl. 425-383.000.

Weber und Springmann: *See*—
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Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, to Olin Corporation. Use of selected pyridine-N-oxide disulfide compounds to treat or prevent bovine mastitis. 4,610,993, Cl. 514-335.000.

Wedtech Corp.: *See*—
Ionescu, Dragos; and Soiman, Mihai, 4,610,237, Cl. 123-600.000.

Weeds, Arthur, to McKenzie & Ridley Limited. Chain link connection. 4,610,647, Cl. 474-206.000.

Weiblen, Rolf-Diether. Device for heat insulation and air conditioning. 4,610,293, Cl. 160-120.000.

Weichenrieder, Erich, to Recycloplast AG. Mixing particulate materials. 4,610,399, Cl. 241-101.00B.

Weikl, Andreas; and Merkel, Volkmar, to Schneider Medintag AG. Method for the elimination or the enlargement of points of constriction in vessels carrying body fluids. 4,610,662, Cl. 604-53.000.

Weinberg, Bernd: *See*—
Depel, William A.; Weinberg, Bernd; and Moon, Jerald B., 4,610,691, Cl. 623-9.000.

Weiner, Alan L.: *See*—
Fountain, Michael W.; Weiss, Steven J.; Kearns, John J.; Weiner, Alan L.; and Popescu, Mircea C., 4,610,868, Cl. 424-1.100.

Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., to Sherritt Gordon Mines Limited. Recovery of gold from refractory auriferous iron-containing sulphidic material. 4,610,724, Cl. 75-118.00R.

Weirauch, Kurt: *See*—
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; Michael, Dietrich; Weirauch, Kurt; and Schafer, Walter, 4,611,034, Cl. 525-420.000.

Weis, Philip J.; and Cook, Richard A., to Dana Corporation. Power takeoff assembly. 4,610,175, Cl. 74-15.860.

Weiskopf, Francis B., Jr.: *See*—
Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., 4,610,249, Cl. 128-328.000.

Weisman, Paul T.; and Goldman, Stephen A. High-density absorbent structures. 4,610,678, Cl. 604-368.000.

Weisman, S. Miller, II, to Ford Motor Company. Method of controlling automatic transmission shift pressure. 4,611,285, Cl. 364-424.100.

Weiss, Marija: *See*—
Eitenmuller, Jurgen; Rackur, Helmut; Wimmer, Walter; and Weiss, Marija, 4,610,692, Cl. 623-16.000.

Weiss, Steven J.: *See*—
Fountain, Michael W.; Weiss, Steven J.; Kearns, John J.; Weiner, Alan L.; and Popescu, Mircea C., 4,610,868, Cl. 424-1.100.

Wentzell, Joseph M., to Nyby Uddeholm Powder AB. Method of an apparatus for making metal powder. 4,610,719, Cl. 75-0.50C.

Werkzeugmaschinenfabrik Oerlikon-Buehrle AG: *See*—
Miller, Peter A., 4,611,126, Cl. 307-64.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Schmid, Samuel; and Novet, Hans-Peter, 4,610,191, Cl. 89-34.000.

Weseloh, William E.: *See*—
Beck, Niels J.; Gilbert, Edward T.; Weseloh, William E.; and Rudolph, Kenneth, 4,610,267, Cl. 137-329.300.

Wesling, Henry J., to Westinghouse Electric Corp. Chopper frequency determination apparatus. 4,611,153, Cl. 318-318.000.

Wess, Gunther: *See*—
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,610,999, Cl. 514-401.000.
Beck, Gerhard; Bartmann, Wilhelm; Lau, Hans-Hermann; and Wess, Gunther, 4,611,000, Cl. 514-401.000.

Westinghouse Electric Corp.: *See*—
Gaida, Walter E.; and Kun, Zoltan K., 4,610,754, Cl. 156-601.000.
Gasparro, Michael R.; and Besterci, Anthony P., Jr., 4,610,838, Cl. 376-248.000.
Leach, Dirk S., 4,610,840, Cl. 376-283.000.
Lonky, Martin L., 4,611,308, Cl. 365-184.000.
McShane, James L., 4,610,167, Cl. 73-861.280.
Page, Derrick J., 4,611,222, Cl. 357-30.000.
Phifer, Clarence G., 4,610,775, Cl. 204-298.000.
Wesling, Henry J., 4,611,153, Cl. 318-318.000.

Wetzel, Gustav: *See*—
Seibert, Frank; and Wetzel, Gustav, 4,611,117, Cl. 250-252.100.

Whaling, Michael H. Cavitating jet device. 4,610,321, Cl. 175-422.00R.

White Consolidated Industries, Inc.: *See*—
Molander, Lance E.; Tiegelmann, Gabriel; and Kirhofer, Walter J., 4,610,492, Cl. 312-305.000.

Whitlock, Robert R.; and Papanicolaou, Nicolas A., to United States of America, Navy. Ssw-CTD parallel to serial imager. 4,611,140, Cl. 310-313.00B.

Wieland-Werke AG: *See*—
Steeb, Jorg, 4,610,843, Cl. 420-473.000.

Wigness, Bruce D.: *See*—
Buchwald, Henry; Guzman, Eugenio; and Wigness, Bruce D., 4,610,658, Cl. 604-9.000.

Wilbur, Leonard P., Jr.: *See*—
Craig, Daniel E.; Walker, Clarence E., Jr.; and Wilbur, Leonard P., Jr., 4,610,636, Cl. 445-68.000.

Wilcox, Thomas J.: *See*—
Arnold, Don C.; and Wilcox, Thomas J., 4,610,429, Cl. 251-148.000.

Wile, Donald E.: *See*—
Hockersmith, Thomas F.; and Wile, Donald E., 4,610,595, Cl. 414-222.000.

Wilhite, John E.: *See*—
Boothroyd, Donald C.; Wilhite, John E.; and Norman, Robert W., Jr., 4,611,278, Cl. 364-200.000.

Willcocks, Kenneth: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,610,992, Cl. 514-320.000.

William H. Rorer, Inc.: *See*—
Yelnosky, John; and Mir, Ghulam N., 4,611,011, Cl. 514-596.000.

Williams, Eugene C.; and Pearson, Phil E., Jr., to General Electric Company. Apparatus for altering the spatial characteristics of a digital image by polynomial interpretation using sets of arithmetic processors. 4,611,348, Cl. 382-44.000.

Williams, Gregory A., to Zenith Electronics Corporation. Two mode scrambling system using identifier pulse in vertical blanking interval. 4,611,242, Cl. 358-123.000.

Williams, John H.: *See*—
Porter, Stanley P.; Williams, John H.; and Avery, William W., 4,610,356, Cl. 206-423.000.

Wilsberg, Heinz-Manfred; Puchta, Rolf; Koester, Klaus; and Carduck, Franz-Josef, to Henkel Kommanditgesellschaft auf Aktien. Washing additive in paste form containing an activator for per compounds, and package therefor. 4,610,799, Cl. 252-90.000.

Wilson, David N.: *See*—
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,610,844, Cl. 426-641.000.

Wilson, Geoffrey C., to Ferranti plc. Manufacture of printed circuit boards. 4,610,758, Cl. 156-656.000.

Wilson, Gregory B.; and Fudenberg, Herman H., to Medical University of South Carolina. Use of in vitro assay techniques to measure parameters related to clinical applications of transfer factor therapy. 4,610,878, Cl. 424-88.000.

Wilson, Max K.: *See*—
Kiersarsky, Albert S.; Sauer, Earl S.; Vesperman, William C.; and Wilson, Max K., 4,610,909, Cl. 428-202.000.

Wimmer, Walter: *See*—
Eitenmuller, Jurgen; Rackur, Helmut; Wimmer, Walter; and Weiss, Marija, 4,610,692, Cl. 623-16.000.
Wincanton Engineering Limited: *See*—
Tait, John A. R., 4,610,885, Cl. 426-130.000.
Windmoller & Holscher: *See*—
Rautenberg, Horst, 4,610,654, Cl. 493-477.000.
Winfield, Barbara L.: *See*—
Mickelson, Jim; and Winfield, Barbara L., 4,610,087, Cl. 30-147.000.
Winslow, John S., to Discovision Associates. Method and apparatus for monitoring the storage of information on a storage medium. 4,611,318, Cl. 369-54.000.
Wirth, Helmut: *See*—
Becker, Johann A.; Wirth, Helmut; and Zell, Werner, 4,610,505, Cl. 350-96.230.
Wisconsin Alumni Research Foundation: *See*—
Mosher, Deane F., 4,610,960, Cl. 435-7.000.
Wise, Walter G. High velocity, even flow flame treatment of webs. 4,610,627, Cl. 432-8.000.
Wissler, Josef H., to Max-Planck Gesellschaft Zur Forderung der Wissenschaften. Process for producing and obtaining anaphylatoxin- and cocytotaxin-containing leucotaxine preparations and of anaphylatoxin and cocytotaxin proteins in molecularly homogeneous, biologically active form. 4,610,815, Cl. 530-380.000.
Wissmann, Michael; Nickel, Hans; Fink, Reinhold; and Leuchte, Michael, to Andreas Stihl. Crankshaft assembly for an engine of a portable tool. 4,610,229, Cl. 123-195.00R.
Wittek Industries, Inc.: *See*—
Spaulding, George E., 4,610,187, Cl. 81-9.300.
Wixon, Harold E.: *See*—
Chirash, William; and Wixon, Harold E., 4,610,796, Cl. 252-8.750.
Woerner, Pierre: *See*—
Veaux, Jacques; Dubos, Jean-Michel; and Woerner, Pierre, 4,610,411, Cl. 244-50.000.
Wolbrink, David W.: *See*—
Sarnosky, Joseph R.; and Wolbrink, David W., 4,610,705, Cl. 55-316.000.
Wolfe, Al R., to Phillips Petroleum Co. Propylene polymer composition containing a hydrotalcite and an acetal of an alditol. 4,611,024, Cl. 524-366.000.
Wolff-Mooij, Marcelle N., to Steritech B.V. Connector assembly for sterile connection or two internally sterile containers of tubings. 4,610,469, Cl. 285-260.000.
Wollar, Burnell J.; and Schwind, Richard J., to Phillips Plastics Corporation. Reusable two-piece fastener. 4,610,587, Cl. 411-60.000.
Wolloff, Frank H.: *See*—
Yardley, Robert; Cameron, Ewen R.; and Wolloff, Frank H., 4,610,041, Cl. 12-55.100.
Won, Kwang J.: *See*—
Matesa, Joseph M.; Won, Kwang J.; and Demarest, Henry M., Jr., 4,610,711, Cl. 65-134.000.
Wong, John W.: *See*—
Underhill, Edward W.; Wong, John W.; Palaniswamy, Pachagounder; Steck, Warren F.; and Chisholm, Melvin D., 4,610,876, Cl. 424-84.000.
Wong, Patrick S. L.: *See*—
Ayer, Atul; Theeuwes, Felix; and Wong, Patrick S. L., 4,610,686, Cl. 604-890.000.
Wood, Richard D., to United Technologies Automotive, Inc. Quick connect/disconnect coupling. 4,610,468, Cl. 285-81.000.
Woods, Theodore E., to Syntron, Inc. Location indicator for a marine seismic cable comprising operator controlled saturable core magnetometers. 4,611,171, Cl. 324-253.000.
Wright, Allen J., to Intelledex Incorporated. Gripper interface for a robot. 4,610,597, Cl. 414-729.000.
Wright, Antony P.: *See*—
Rivers-Farrell, Stacia A.; and Wright, Antony P., 4,611,042, Cl. 528-32.000.
Wright, William B., Jr.: *See*—
Marsico, Joseph W., Jr.; and Wright, William B., Jr., 4,610,981, Cl. 514-158.000.
Wroczynski, Ronald J.: *See*—
Hayes, Kathryn S.; Frihart, Charles R.; and Wroczynski, Ronald J., 4,611,051, Cl. 528-295.300.
Wstergren, Orjan: *See*—
Astner, Gunnar; Wstergren, Orjan; and Thornblom, Jan, 4,611,110, Cl. 219-121.0PY.
Wusthof, Peter: *See*—
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Wycech, Joseph S., to General Motors Corporation. Method of reinforcing a structural member. 4,610,836, Cl. 264-313.000.
Wysocki, Kazmier: *See*—
Spreen, George E.; Herold, Hans; and Wysocki, Kazmier, 4,610,345, Cl. 198-392.000.
Xerox Corporation: *See*—
Aser, Gilbert A., 4,610,526, Cl. 355-3.0BE.
Augostini, Carl W., 4,610,386, Cl. 227-142.000.
Hou, Hsieh S., 4,611,349, Cl. 382-47.000.
Lehmbeck, Donald R.; and Banton, Martin E., 4,610,530, Cl. 355-14.0TR.
Xomox Corporation: *See*—
Sandling, Michael J., 4,610,266, Cl. 137-315.000.
Yabe, Masaya: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,611,224, Cl. 357-30.000.
Yagi, Hiroshi; and Harada, Yoshio, to TDK Corporation. Method of and apparatus for supplying and transferring electronic components. 4,610,280, Cl. 140-105.000.
Yamada, Akira: *See*—
Beard, Charles D.; Doddi, Namassivaya; and Yamada, Akira, 4,611,061, Cl. 548-260.000.
Yamada, Hiroyuki: *See*—
Hiratake, Susumu; Nakanishi, Yoichi; Inuzuka, Sinobu; Takeo, Kato; Yamada, Hiroyuki; and Watanabe, Yasuo, 4,610,296, Cl. 164-469.000.
Yamada, Hisao; Shimogawa, Toshiaki; Koide, Teruhiko; and Iwatsuki, Masahiro, to Nippon Soken, Inc.; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Built-in type safety seat belt system for reclining vehicle seat. 4,610,480, Cl. 297-478.000.
Yamada, Hisayoshi: *See*—
Honjo, Yoshihiko; Yamada, Hisayoshi; Hosono, Kazuhiro; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,611,248, Cl. 358-342.000.
Yamada, Keiichi: *See*—
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Yamada, Makoto: *See*—
Yasumatsu, Jun; Motonami, Masanao; and Yamada, Makoto, 4,610,464, Cl. 280-808.000.
Yamada, Masao; and Kawakami, Haruo, to Fuji Electric Company Ltd. Corrosion preventing device for in-pile structures of helium gas-cooled reactor. 4,610,841, Cl. 376-305.000.
Yamada, Mitsunori; Ishii, Masaji; Miyai, Akira; Nakajima, Yukihiko; and Sato, Shinsei, to Denki Kagaku Kogyo Kabushiki Kaisha. Chlorosilane disproportionation catalyst and method for producing a silane compound by means of the catalyst. 4,610,858, Cl. 423-342.000.
Yamamoto, Etsuo: *See*—
Sorimachi, Kazuaki; Tanabe, Hiroshi; Aota, Katsumi; Sekiguchi, Kanetaka; Togashi, Seigo; and Yamamoto, Etsuo, 4,610,509, Cl. 350-339.00F.
Yamamoto, Hachizou: *See*—
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Yamamoto, Kazuo: *See*—
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Yamamoto, Kunihiko: *See*—
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Yamamoto, Kyonosuke: *See*—
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Yamamoto, Minoru: *See*—
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Yamamoto, Nobuyuki: *See*—
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Yamamoto, Sadaaki: *See*—
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Yamamoto, Shirushi: *See*—
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Yamamoto, Takakazu; Yamamoto, Sadaaki; Kobayashi, Sadao; and Sukawa, Hiroshi, to Mitsui Toatsu Chemicals, Inc. Iodine-containing conductive resin composition. 4,610,811, Cl. 252-511.000.
Yamamoto, Toshiaki; and Kinami, Kenichi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Production of sucrose fatty acid polyester. 4,611,055, Cl. 536-119.000.
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, to Ube Industries, Ltd. Inorganic fiber-reinforced ceramic composite material. 4,610,917, Cl. 428-224.000.
Yamano, Yoshikazu: *See*—
Miyazaki, Hideaki; Yamano, Yoshikazu; Saito, Yasunori; Okano, Mikihiko; and Nakano, Tsuneo, 4,610,503, Cl. 350-96.200.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,610,821, Cl. 540-200.000.
Yamaoka, Hideyoshi: *See*—
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Yamaoka, Nobutatsu: *See*—
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,968, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,969, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,970, Cl. 501-137.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,610,971, Cl. 501-137.000.
Yamashita, Nobuo: *See*—
Nishioka, Kimihiko; and Yamashita, Nobuo, 4,610,513, Cl. 350-442.000.
Yamashita, Osamu; Moriyama, Noboru; Ootani, Shoji; and Wasamoto, Katsuyo, to KAO Corporation. Salts of alkenylsuccinic monoesters. 4,611,087, Cl. 560-81.000.

Yamashita, Takeo: *See*—
Kumasaka, Noriyuki; Fujiwara, Hideo; Saito, Noritoshi; Otomo, Shigekazu; Yamashita, Takeo; and Kudo, Mitsuhiro, 4,610,935, Cl. 428-632.000.
Yamazaki, Masuo: *See*—
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Yamazaki, Osamu: *See*—
Setsune, Kentaro; Yamazaki, Osamu; Wasa, Kiyotaka; and Tazuke, Kazuo, 4,610,894, Cl. 427-53.100.
Yamazaki, Toshio: *See*—
Lipson, Melvin A.; Derrico, Gene A.; Tark, Sung Y.; and Yamazaki, Toshio, 4,610,951, Cl. 430-313.000.
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Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,611,199, Cl. 340-576.000.
Yardley, John P.: *See*—
Husbands, G. E. Morris; Yardley, John P.; and Muth, Eric A., 4,611,078, Cl. 558-410.000.
Yardley, Robert; Cameron, Ewen R.; and Wolloff, Frank H., to Enhart Corporation. Folding machines. 4,610,041, Cl. 12-55.100.
Yashiki, Yuichi; and Tanaka, Takashi, to Canon Kabushiki Kaisha. Electrophotographic member having corresponding thin end portions of charge generation and charge transport layers. 4,610,942, Cl. 430-58.000.
Yasumatsu, Jun; Motonami, Masanao; and Yamada, Makoto, to Toyota Jidosha Kabushiki Kaisha. Shoulderbelt anchor device. 4,610,464, Cl. 280-808.000.
Yasunaga, Makoto; and Ikehata, Tsutomu, to Citizen Watch Co., Ltd. Leaf spring unit for a dot matrix printer. 4,610,553, Cl. 400-124.000.
Yau, Robert L.: *See*—
Chuang, Patrick T.; Maltiel, Ron; and Yau, Robert L., 4,611,309, Cl. 365-185.000.
Yazaki Corporation: *See*—
Seiyama, Tetsuro; Arai, Hiromichi; and Kunisaki, Toshiya, 4,610,867, Cl. 423-635.000.
Yazu, Shuji; and Nakamura, Tsutomu, to Sumitomo Electric Industries, Ltd. Hard diamond sintered body and the method for producing the same. 4,610,699, Cl. 51-309.000.
Yelnosky, John; and Mir, Ghulam N., to William H. Rorer, Inc. Amidinoureas for treating irritable bowel syndrome. 4,611,011, Cl. 514-596.000.
Yerkovich, Daniel: *See*—
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,610,254, Cl. 128-419.00D.
Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Dikstein, Shabtay; and Hartzshtark, Abraham, 4,610,978, Cl. 514-46.000.
Yoakim, Christiane: *See*—
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,611,056, Cl. 544-31.000.
Guindon, Yvan; Morton, Howard E.; and Yoakim, Christiane, 4,611,068, Cl. 549-292.000.
Yokoo, Shouzou, to Hitachi, Ltd. Transmission change-over mechanism for selectively driving automatic-loading and tape-operation means in a magnetic recording and reproducing apparatus. 4,611,251, Cl. 360-85.000.
Yokota, Akira, to Olympus Optical Co., Ltd. Photographic lens system for endoscopes. 4,610,516, Cl. 350-475.000.
Yokota, Akira: *See*—
Hashimoto, Koichiro; Yamamoto, Shirushi; Nakane, Hisashi; and Yokota, Akira, 4,610,953, Cl. 430-331.000.
Yonehara, Ikuo: *See*—
Kajitani, Taizo; Fujii, Shigeo; Sato, Tadao; Yonehara, Ikuo; Fukumura, Chikashi; and Harita, Kenji, 4,610,853, Cl. 423-310.000.
Kajitani, Taizo; Fujii, Shigeo; Sato, Tadao; Yonehara, Ikuo; Fukumura, Chikashi; and Harita, Kenji, 4,610,862, Cl. 423-310.000.
Yoneyama, Shigeki: *See*—
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Yoneyama, Tomio: *See*—
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Yonezawa, Toshio: *See*—
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Yoshida Kogyo K. K.: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Makoto: *See*—
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,610,821, Cl. 540-200.000.
Yoshida, Masaaki; and Kataoka, Hiroyuki, to Canon Kabushiki Kaisha. Electronic flash device. 4,610,525, Cl. 354-415.000.
Yoshida, Noboru: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Tanno, Norihiko; Sato, Hiromi; and Yoshida, Noboru, 4,610,986, Cl. 514-239.000.
Yoshida, Tomio: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Sasaki, Yuko; Suzuki, Katsumi; Minato, Akira; and Yoshida, Tomio, 4,610,732, Cl. 148-6.14R.
Yoshida, Toshio: *See*—
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, 4,610,522, Cl. 354-173.100.
Yoshihara, Kenji: *See*—
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Yoshimura, Toyofusa: *See*—
Kawamoto, Mineo; Murakami, Kanji; Akahoshi, Haruo; Matsuda, Yoichi; Wajima, Motoyo; Matsunaga, Makoto; Kawakubo, Shoji; Yoshimura, Toyofusa; Suzuki, Haruo; and Yoshida, Tomio, 4,610,910, Cl. 428-209.000.
Yoshinaga, Shoji: *See*—
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Yoshinaga, Toru: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Natsuyama, Yukihiro, 4,610,427, Cl. 251-129.060.
Yoshinaka, Tadaaki; and Noguchi, Toshiaki, to Sony Corporation. Apparatus for recording a video signal. 4,611,250, Cl. 360-9.100.
Yoshino, Takeshi: *See*—
Tobioka, Takashi; Nishizawa, Tetuo; Ishiguro, Minoru; Yoshida, Toshio; Komori, Masanoshin; Asano, Seiji; Yoshino, Takeshi; and Hara, Hiroshi, 4,610,522, Cl. 354-173.100.
Young & Thompson: *See*—
Walker, John G., 4,610,213, Cl. 114-102.000.
Young, William I., to Hy-Con Products, Inc. Container for static-sensitive articles. 4,610,353, Cl. 206-328.000.
Yu, Ho: *See*—
Jacoby, John E.; Yu, Ho; and Ramser, Robert A., 4,610,295, Cl. 164-5.000.
Yuhas, Marjorie P.: *See*—
Asmuth, Richard L.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,094, Cl. 179-7.1TP.
Asmuth, Richard L.; DiCarlo-Cottone, Melchior J.; Ermann, Renato M.; Gauldin, Mark A.; Gawrys, George W.; Raj-karne, Dattatraya G.; Stone, Roger E.; and Yuhas, Marjorie P., 4,611,096, Cl. 179-18.00B.
Yukawa, Toshihide; Ikeda, Toru; Kishimoto, Shinichi; and Sugiyama, Katsumi, to Ajinomoto Co., Inc. Amino acid complex and a method for optical resolution of a DL-amino acid. 4,610,827, Cl. 260-501.110.
Yura, Takeshi: *See*—
Murai, Wasaburo; and Yura, Takeshi, 4,611,188, Cl. 335-16.000.
Zahoransky, Anton: *See*—
Steinebrunner, Walter, 4,610,481, Cl. 300-21.000.
Zamek, Otto S., to General Electric Company. Ether modified polyester resins. 4,611,021, Cl. 524-317.000.
Zapf, Hans: *See*—
Bauer, Volker; and Ranke, Horst, 4,611,330, Cl. 373-14.000.
Zaschke, Horst: *See*—
Schellenberger, Michael; Richter, Sabine; Deutscher, Hans-Joachim; Zaschke, Horst; and Demus, Dietrich, 4,610,805, Cl. 252-299.620.
Zell, Werner: *See*—
Becker, Johann A.; Wirth, Helmut; and Zell, Werner, 4,610,505, Cl. 350-96.230.
Zenith Electronics Corporation: *See*—
Albin, William W., 4,611,241, Cl. 358-60.000.
Campisi, Carl; Kilinskis, David C.; Skerlos, Peter C.; and Sorlie, Egil, 4,610,083, Cl. 29-832.000.
Nienaber, David K., 4,611,230, Cl. 358-158.000.
Srivastava, Gopal K.; and Lee, Ronald B., 4,611,229, Cl. 358-158.000.
Williams, Gregory A., 4,611,242, Cl. 358-123.000.
Zeria Shinyaku Kogyo Kabushiki Kaisha: *See*—
Miyamoto, Yosuke; Goto, Hajime; Sato, Hiroshi; Okano, Hiroshi; and Iijima, Masao, 4,610,891, Cl. 427-3.000.
Zhagars, Andrei K.; Grinshtein, Voldemar Y.; and Novak, Nikolai B., to Latviisky Gosudarstvenny Universitet Imeni P.Stuchki. Photochemical method for preparing 4-keto-9-methylphenazine. 4,610,767, Cl. 204-157.810.
Zhizhilev, Savely A.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Vikior I., 4,610,850, Cl. 422-131.000.
Ziauddin, Habeeb M.: *See*—
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,610,844, Cl. 426-641.000.
Ziegler, Heinz: *See*—
Hofmann, Hans; and Ziegler, Heinz, 4,610,441, Cl. 269-48.100.
Ziegner, Bernhard A., to Motorola, Inc. Noncontacting MIC ground plane coupling using a broadband virtual short circuit gap. 4,611,186, Cl. 333-246.000.
Ziese, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for acoustically surveying the surface contours of the bottom of a body of water. 4,611,313, Cl. 367-88.000.
Zimmer, Myron P., to Deere & Company. Knee mounted service step for two-wheel drive tractor. 4,610,456, Cl. 280-165.000.
Ziyad Incorporated: *See*—
Schneider, Helmut A.; and Fazio, Dominick, 4,610,445, Cl. 271-160.000.

Zoller, Henry. Process for continuous production of a fibrous, bonded material directly from a polymeric solution. 4,610,830, Cl. 264-9.000.
Zones, Stacey I., to Chevron Research Company. Zeolite SSZ-15 and process for preparing the same. 4,610,854, Cl. 423-326.000.
Zumfeld, Heinz: *See*—
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,610,132, Cl. 57-22.000.
Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, 4,610,133, Cl. 57-22.000.
Zwicky, Peter: *See*—
Canavesi, Pietro L.; and Zwicky, Peter, 4,610,120, Cl. 52-511.000.
501 Machinefabriek de Boer B.V.: *See*—
Kosman, Wilhelmus J. M., 4,610,616, Cl. 425-99.000.
501 Peinemann Equipment B.V.: *See*—
Verstraeten, Paul F. M., 4,610,064, Cl. 29-239.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 9TH DAY OF SEPTEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Andersen, Dennis, to Armotek Industries, Inc. Methods and apparatus for applying wear resistant coatings to rotogravure cylinders. Re. 32,244, Cl. 427-34.000.

Armotek Industries, Inc.: *See*—
Andersen, Dennis, Re. 32,244, Cl. 427-34.000.

Eckberg, Richard P.: *See*—
Grenoble, Maurice E.; and Eckberg, Richard P., Re. 32,245, Cl. 427-387.000.

General Electric Company: *See*—
Grenoble, Maurice E.; and Eckberg, Richard P., Re. 32,245, Cl. 427-387.000.

Grenoble, Maurice E.; and Eckberg, Richard P., to General Electric Company. Multi-component solventless silicone release coating system. Re. 32,245, Cl. 427-387.000.

Horodysky, Andrew G., to Mobil Oil Corporation. Borated epoxides and lubricants containing same. Re. 32,246, Cl. 252-49.600.

Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheelchair construction. Re. 32,242, Cl. 280-242.0WC.

Mobil Oil Corporation: *See*—
Horodysky, Andrew G., Re. 32,246, Cl. 252-49.600.

Quadra Wheelchairs, Inc.: *See*—
Minnebraker, Jeffrey P., Re. 32,242, Cl. 280-242.0WC.

Rhone-Poulenc Agrochimie: *See*—
Theissen, Robet J., Re. 32,243, Cl. 71-98.000.

Saxer, Kurt, to Sulzer Brothers Limited. Fractional crystallization process. Re. 32,241, Cl. 62-542.000.

Sulzer Brothers Limited: *See*—
Saxer, Kurt, Re. 32,241, Cl. 62-542.000.

Theissen, Robet J., to Rhone-Poulenc Agrochimie. Esters of substituted phenoxybenzoic acids, compositions of the same and herbicidal use thereof. Re. 32,243, Cl. 71-98.000.

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# LIST OF DESIGN PATENTEES

Adler Instrument Company: *See*—
Davison, John A.; and Kellar, Robert J., 285,605, Cl. D24-28.000.

Adolph, Peter A. Toy baseball batter. 285,580, 9-9-86, Cl. D21-51.000.

Adolph, Peter A. Toy baseball pitcher. 285,581, 9-9-86, Cl. D21-51.000.

Alfex S.A.: *See*—
Moser, Andreas, 285,543, Cl. D11-4.000.

Algate Instrument Corporation: *See*—
Allen, Frank L., 285,540, Cl. D10-74.000.

Allen, Frank L., to Algate Instrument Corporation. Transit reticle or similar article. 285,540, 9-9-86, Cl. D10-74.000.

Alpine Electronics, Inc.: *See*—
Tanaka, Fumio; and Yamaguchi, Akio, 285,542, Cl. D10-106.000.

American Cyanamid Company: *See*—
Berish, Andrew J.; and Kokoska, Thomas J., 285,533, Cl. D9-352.000.

Andersson, Karl A.: *See*—
Ferm, Morgan; and Andersson, Karl A., 285,520, Cl. D7-321.000.

Aquarius Industries, Inc.: *See*—
McKeel, Gary M., 285,598, Cl. D23-55.000.

AT&T Information Systems Inc.: *See*—
Mack, Henry J.; McGarvey, John N.; Paas, Terrance J.; Prince, Terry B.; and Zambelli, Michael P., 285,561, Cl. D14-100.000.

AT&T Teletype Corporation: *See*—
LaSpesa, Richard E., 285,576, Cl. D18-22.000.

Avmor Ltd.: *See*—
Warshaw, Kell; and Deutchman, Paul, 285,602, Cl. D23-74.000.

Ayukawa, Isao; Fujii, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, to Sharp Corporation. Electro-magnetic induction heater. 285,523, 9-9-86, Cl. D7-367.000.

Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, to Matsushita Electric Industrial Co., Ltd. Telephone set with automatic dialer and speaker phone. 285,553, 9-9-86, Cl. D14-52.000.

Babcock & Wilcox Company, The: *See*—
Golden, Raymond; and Whaley, George S., 285,563, Cl. D14-103.000.

Barrus, Jeffrey C.: *See*—
Reitz, Christopher J.; and Barrus, Jeffrey C., 285,569, Cl. D14-114.000.

Basini, Ronald J. Portable collapsible combination sink and stove. 285,522, 9-9-86, Cl. D7-334.000.

Baus, Heinz G. Sliding shower door. 285,601, 9-9-86, Cl. D23-69.000.

Beaumont, Thomas G.; and Tokiyama, Masaru, to Motorola, Inc. Control unit or similar article for interconnecting radio and telephone sets. 285,554, 9-9-86, Cl. D14-52.000.

Beggs, George; and Richardson, Thomas H. Dental flosser. 285,616, 9-9-86, Cl. D28-64.000.

Benjamin Crook & Sons Limited: *See*—
Peel, Simon J., 285,591, Cl. D21-205.000.

Berish, Andrew J.; and Kokoska, Thomas J., to American Cyanamid Company. Bottle. 285,533, 9-9-86, Cl. D9-352.000.

Bevilacqua, Ernest; and Pferd, William, III, to Skantek Corporation. Combined document scanner and monitor unit. 285,564, 9-9-86, Cl. D14-106.000.

Billiet, Frank, to Mirodan, Etn. L. d'Haene & Zonen. Wall mirror. 285,505, 9-9-86, Cl. D6-300.000.

Bisher, Harry E.: *See*—
Douglas, James T.; and Bisher, Harry E., 285,510, Cl. D6-556.000.

Bocko, John J., to North American Philips Consumer Electronics Corp. Speaker telephone set. 285,557, 9-9-86, Cl. D14-56.000.

Bool, Robert A., to Ozzzlo Pty. Ltd. Pillow. 285,512, 9-9-86, Cl. D6-601.000.

Borgman, Bradley N., to Sunkist Growers, Inc. Vacuum cup for article lifting machine. 285,618, 9-9-86, Cl. D32-4.000.

Bristow, James R.; and Davila, Joaquin R., to Coca-Cola Company, The. Coin operated cup vending machine. 285,577, 9-9-86, Cl. D20-4.000.

Broadway Industries, Inc.: *See*—
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 285,597, Cl. D23-25.000.

Brown, John F.; and Kottke, Robert L. Vehicle safety mirror. 285,548, 9-9-86, Cl. D12-187.000.

Buchholz, John F.; and Rahn, Henry J., to Corning Glass Works. Bottle or the like. 285,535, 9-9-86, Cl. D9-367.000.

Bulgari, Marina, to Marina B. Creation Limited. Ring. 285,544, 9-9-86, Cl. D11-34.000.

Burger, Christian, to Burger Sohne AG Burg. Case for tobacco products. 285,615, 9-9-86, Cl. D27-47.000.

Burger Sohne AG Burg: *See*—
Burger, Christian, 285,615, Cl. D27-47.000.

Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 285,527, Cl. D8-105.000.
Schwartz, Frederic W., 285,552, Cl. D13-30.000.

Champion Spark Plug Company: *See*—
Gimple, James J.; and Lasley, Charles T., 285,596, Cl. D23-17.000.

Christopherson, Kjell H. I., to Gambro Lundia AB. Housing for a medical disk filter. 285,606, 9-9-86, Cl. D24-34.000.

Coca-Cola Company, The: *See*—
Bristow, James R.; and Davila, Joaquin R., 285,577, Cl. D20-4.000.

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Prevot, Olivier H. C., 285,524, Cl. D7-372.000.
Douglas, James T.; and Bisher, Harry E. Bracket for a hanging plant, or similar article. 285,510, 9-9-86, Cl. D6-556.000.
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Toth, Richard J.; Krumin, Donald K.; and Eckmann, John A., 285,559, Cl. D14-68.000.
Eguchi, Yoshiaki; and Uchida, Koji, to Janome Sewing Machine Co., Ltd. Sewing machine. 285,571, 9-9-86, Cl. D15-69.000.
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Nado, Willard C.; Schick, George L.; Tarnowski, John S.; and Kipp, Frederick M., 285,619, Cl. D32-21.000.
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Elkerbout, Marten F., to U.S. Philips Corporation. Scale. 285,541, 9-9-86, Cl. D10-91.000.
Ferm, Morgan; and Andersson, Karl A., to Hammarplast AB. Vacuum jug. 285,520, 9-9-86, Cl. D7-321.000.
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Lanius, Charles A., 285,595, Cl. D22-136.000.
Fletcher, Tracy, to Pillow Pal, Inc. Doll. 285,590, 9-9-86, Cl. D21-166.000.
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Gimple, James J.; and Lasley, Charles T., to Champion Spark Plug Company. Robot mounted spray gun. 285,596, 9-9-86, Cl. D23-17.000.
Giovagnoli, Paul S., to Durastill, Inc. Water dispenser. 285,519, 9-9-86, Cl. D7-311.000.
Golden, Raymond; and Whaley, George S., to Babcock & Wilcox Company, The. Wedge shaped console for data processing console grouping. 285,563, 9-9-86, Cl. D14-103.000.
Graham, John F.; and Williams, Daniel L., to Keycom Electronic Publishing. Information system terminal or the like. 285,562, 9-9-86, Cl. D14-100.000.
Haack, Ernesto R., to Orion Industries, Inc. Adjustable automotive mirror support. 285,549, 9-9-86, Cl. D12-187.000.
Habermehl, William M. Bulletin board. 285,578, 9-9-86, Cl. D20-42.000.
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Hara, Kunio; and Sutoh, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Printer for electronic computers. 285,565, 9-9-86, Cl. D14-111.000.
Hayashi, Shigeaki, to Sharp Corporation. Printer. 285,566, 9-9-86, Cl. D14-111.000.
Hayslette, Ronald P., to Jensen General Corp. Protective cover for vehicle roof vent. 285,546, 9-9-86, Cl. D12-155.000.
Hill, James D. Gameboard. 285,579, 9-9-86, Cl. D21-18.000.
Hollinshead, Clive. Spring actuated chop sticks. 285,518, 9-9-86, Cl. D7-105.000.
Hoshino Gakki Co., Ltd.: *See—*
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Hoshino, Kenji, to Data East Corporation. Facsimile device. 285,560, 9-9-86, Cl. D14-94.000.
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Host, Henrik, to Interlego A.G. Toy construction roundabout. 285,593, 9-9-86, Cl. D21-249.000.
Hubotics, Inc.: *See—*
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Kushner, Philip M., 285,592, Cl. D21-248.000.
Isaacs, Robert B., to Northern Telecom Limited. Telephone set remote accessory stand. 285,558, 9-9-86, Cl. D14-59.000.
Itoh, Senji; Ikushima, Fumio; and Kogashiwa, Kiyonori, to Toyoseikan Kaisha Limited. Can. 285,534, 9-9-86, Cl. D9-365.000.
Iwahashi, Wataru: *See—*
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Kassai, Kenzou, to Kassai Kabushiki Kaisha. Construction toy. 285,583, 9-9-86, Cl. D21-108.000.
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Kim, Young S. Rear view mirror. 285,547, 9-9-86, Cl. D12-187.000.
Kipp, Frederick M.: *See—*
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Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 285,501, 9-9-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 285,502, 9-9-86, Cl. D2-422.000.
Kogashiwa, Kiyonori: *See—*
Itoh, Senji; Ikushima, Fumio; and Kogashiwa, Kiyonori, 285,534, Cl. D9-365.000.
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Korthoff, Herbert W.; and Tompkins, Thomas, to United States Surgical Corporation. Linear surgical stapler with permanent anvil. 285,604, 9-9-86, Cl. D24-26.000.
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Kushner, Philip M., to Interlego A.G. Toy construction boat. 285,588, 9-9-86, Cl. D21-130.000.
Kushner, Philip M., to Interlego A.G. Toy construction Ferris wheel. 285,592, 9-9-86, Cl. D21-248.000.
Lanius, Charles A., to Flambeau Corporation. Minnow bucket. 285,595, 9-9-86, Cl. D22-136.000.
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Gimple, James J.; and Lasley, Charles T., 285,596, Cl. D23-17.000.
LaSpesa, Richard E., to AT&T Teletype Corporation. Printer ribbon cartridge. 285,576, 9-9-86, Cl. D18-22.000.
Lefeuvre, Daniel, to Electronique Serge Dassault. Cash-register terminal. 285,573, 9-9-86, Cl. D18-4.000.
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Murdough, Thomas G., Jr.; and Smith, J. Timothy, 285,586, Cl. D21-108.000.
Lori Lee Productions, Inc.: *See—*
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Loscalzo, Dominick; and Michaelson, Howard W., to Dart Industries Inc. Storage rack for covers for containers. 285,511, 9-9-86, Cl. D6-573.000.
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Macier, William C. Tanning booth. 285,607, 9-9-86, Cl. D24-39.000.
Mack, Henry J.; McGarvey, John N.; Paas, Terrance J.; Prince, Terry B.; and Zambelli, Michael P., to AT&T Information Systems Inc. Keyboard. 285,561, 9-9-86, Cl. D14-100.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,530, 9-9-86, Cl. D9-350.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,532, 9-9-86, Cl. D9-352.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,536, 9-9-86, Cl. D9-398.000.
Madden Corporation: *See—*
Sussman, Abbe J., 285,509, Cl. D6-525.000.
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Martin, Paolo, to Mediana S.A. Air purifying apparatus. 285,603, 9-9-86, Cl. D23-150.000.
Matsushiro, Yukimitsu, to Kabushiki Kaisha Matsushiro. Changeable robot toy. 285,589, 9-9-86, Cl. D21-150.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
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McInerney, Charles E., to Garrett Corporation, The. Turbocharger. 285,570, 9-9-86, Cl. D15-5.000.
McKeel, Gary M., to Aquarius Industries, Inc. Sunken tub. 285,598, 9-9-86, Cl. D23-55.000.
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Mens, Hermanus J. H. Support for flower pots. 285,506, 9-9-86, Cl. D6-404.000.
Messer, William K., to Vagianos, Gust. Placard holder. 285,504, 9-9-86, Cl. D6-300.000.
Meyer, Daniel, to Communications Systems, Inc. Telephone network interface panel. 285,551, 9-9-86, Cl. D13-24.000.
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Middlemist, Richard A. Lectern. 285,507, 9-9-86, Cl. D6-419.000.
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., to Broadway Industries, Inc. Faucet set. 285,597, 9-9-86, Cl. D23-25.000.
Miller, Lawrence J., to Owens-Illinois, Inc. Mug or similar article. 285,516, 9-9-86, Cl. D7-9.000.
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Murdough, Thomas G., Jr.; and Smith, J. Timothy, to Little Tikes Company. Toy construction piece. 285,585, 9-9-86, Cl. D21-108.000.
Murdough, Thomas G., Jr.; and Smith, J. Timothy, to Little Tikes Company. Toy construction piece. 285,586, 9-9-86, Cl. D21-108.000.
Murdough, Thomas G., Jr.; and Smith, J. Timothy. Toy construction piece. 285,587, 9-9-86, Cl. D21-108.000.
Murphy, Paul C. Balcony tray. 285,508, 9-9-86, Cl. D6-429.000.
Nado, Willard C.; Schick, George L.; Tarnowski, John S.; and Kipp, Frederick M., to Electrolux Corporation. Vacuum cleaner. 285,619, 9-9-86, Cl. D32-21.000.
North American Philips Consumer Electronics Corp.: *See—*
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Panas, William R., to S&C Electric Company. High-voltage control module. 285,550, 9-9-86, Cl. D13-24.000.
Papciak, Suzanne. Cup for administering medicine. 285,515, 9-9-86, Cl. D7-6.000.
Parker, James. Bottle. 285,537, 9-9-86, Cl. D9-400.000.
Paulus, John R., to Pizza Hut, Inc. Utensil rack. 285,517, 9-9-86, Cl. D7-74.000.
Peel, Simon J., to Benjamin Crook & Sons Limited. Ball. 285,591, 9-9-86, Cl. D21-205.000.
Peterson, Bertel R.; and Fortuna, Vincent E., to Vercon, Inc. Packaging container. 285,531, 9-9-86, Cl. D9-352.000.
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Prevot, Olivier H. C., to Dito-Sama. Produce peeling machine. 285,524, 9-9-86, Cl. D7-372.000.
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Rauch, Howard L., to North American Philips Corporation. Vibrating bed board. 285,608, 9-9-86, Cl. D24-40.000.
Reitz, Christopher J.; and Barrus, Jeffrey C., to Motorola, Inc. Housing for computer terminal memory module. 285,569, 9-9-86, Cl. D14-114.000.
Ribakusky, John F. Marine engine repair tool. 285,526, 9-9-86, Cl. D8-51.000.
Richardson, Thomas H.: *See—*
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Ritman, Joost R. Plate. 285,513, 9-9-86, Cl. D7-1.000.
Ritman, Joost R. Casserole dish. 285,514, 9-9-86, Cl. D7-1.000.
S&C Electric Company: *See—*
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Sassak, Mark S. Space amusement ride. 285,594, 9-9-86, Cl. D21-250.000.
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Schwartz, Frederic W., to Cable Electric Products, Inc. Cutting, crimping and stripping tool. 285,527, 9-9-86, Cl. D8-105.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Six outlet system. 285,552, 9-9-86, Cl. D13-30.000.
Shaffner, Richard L. Toes protector. 285,500, 9-9-86, Cl. D2-314.000.
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Slocomb, Leon F., Jr., 285,613, Cl. D25-74.000.
Slocomb, Leon F., Jr., to Slocomb Industries, Inc. Window sill extrusion. 285,610, 9-9-86, Cl. D25-74.000.
Slocomb, Leon F., Jr., to Slocomb Industries, Inc. Window header extrusion. 285,611, 9-9-86, Cl. D25-74.000.
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Slocomb, Leon F., Jr., to Slocomb Industries, Inc. Window side frame extrusion. 285,613, 9-9-86, Cl. D25-74.000.
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Kirk, Alexis V., 285,502, Cl. D2-422.000.
Steinhardt, Alan L. Bathtub. 285,600, 9-9-86, Cl. D23-55.000.
Stillwagon, Steven R. Cosmetics case. 285,617, 9-9-86, Cl. D28-83.000.
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Sugiyama, Masakazu: *See—*
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Tanaka, Fumio; and Yamaguchi, Akio, to Alpine Electronics, Inc. Remote controller for mobile security system. 285,542, 9-9-86, Cl. D10-106.000.
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Toth, Richard J.; Krumin, Donald K.; and Eckmann, John A., to Motorola, Inc. Radio pager or similar article. 285,559, 9-9-86, Cl. D14-68.000.
Toyoseikan Kaisha Limited: *See*—
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Trumstedt, Hakan. Dispensing container. 285,538, 9-9-86, Cl. D9-408.000.
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Urich, Joy C., to M. Kamenstein, Inc. Coffee pot. 285,521, 9-9-86, Cl. D7-321.000.
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Messer, William K., 285,504, Cl. D6-300.000.
Vanbragt, Willy. Oil lamp assembly. 285,614, 9-9-86, Cl. D26-11.000.
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# CLASSIFICATION OF PATENTS

## ISSUED SEPTEMBER 9, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

2 4,610,034
4,610,035
12 4,610,036
145 4,610,037
209.1 4,610,038

**CLASS 3**

180 R 4,610,092

**CLASS 4**

285 4,610,039
622 4,610,040

**CLASS 12**

55.1 4,610,041
142 R 4,610,042

**CLASS 15**

111 4,610,043
119 R 4,610,044
167 R 4,610,045
250.16 4,610,046
319 4,610,047
344 4,610,048

**CLASS 16**

286 4,610,049

**CLASS 17**

11 4,610,050
4,610,051
75 4,610,052

**CLASS 24**

30.5 R 4,610,053
67 R 4,610,054
68 CD 4,610,055
197 4,610,056
433 4,610,057
574 4,610,058

**CLASS 28**

187 4,610,059
246 4,610,060

**CLASS 29**

1.23 4,610,061
25.41 4,610,062
33.5 4,610,067
157 R 4,610,063
239 4,610,064
243.53 4,610,065
252 4,610,066
418 4,610,068
421 M 4,610,069
429 4,610,070
458 4,610,071
512 4,610,072
527.6 4,610,073
568 4,610,074
4,610,075
571 4,610,076
572 4,610,077
576 B 4,610,078
583 4,610,079
602 R 4,610,080
623.1 4,610,081
741 4,610,082
832 4,610,083
834 4,610,084

**CLASS 30**

90 4,610,085
135 4,610,086
147 4,610,087
372 4,610,088

**CLASS 33**

1 M 4,610,089
148 R 4,610,090
179.5 R 4,610,091
180 AT 4,610,093
367 4,610,094
517 4,610,095
565 4,610,096

**CLASS 34**

117 4,610,097
209 4,610,098

**CLASS 36**

3 B 4,610,099
42 4,610,100
44 4,610,101
136 4,610,102

**CLASS 43**

17.6 4,610,103
41.2 4,610,104
69 4,610,105

**CLASS 44**

42 4,610,694
51 4,610,695
56 4,610,696

**CLASS 47**

45 4,610,106
47 4,610,107

**CLASS 48**

77 4,610,697

**CLASS 49**

181 4,610,108
381 4,610,109

**CLASS 51**

168 4,610,110
170 MT 4,610,111
241 VS 4,610,112
295 4,610,698
309 4,610,699
425 4,610,113

**CLASS 52**

93 4,610,114
171 4,610,115
204 4,610,116
227 4,610,117
240 4,610,118
309.3 4,610,119
511 4,610,120
520 4,610,121
719 4,610,122

**CLASS 53**

118 4,610,123
399 4,610,124
462 4,610,125
475 4,610,126

**CLASS 55**

35 4,610,700
87 4,610,701
155 4,610,702
274 4,610,703
302 4,610,704
316 4,610,705
497 4,610,706

**CLASS 56**

14.6 4,610,127
16.4 4,610,128
17.5 4,610,129
370 4,610,130

**CLASS 57**

6 4,610,131
22 4,610,132
4,610,133
417 4,610,134

**CLASS 60**

39.01 4,610,135
39.464 4,610,136
39.511 4,610,137
286 4,610,138
327 4,610,139
506 4,610,140
614 4,610,141

**CLASS 62**

3 4,610,142
6 4,610,143
63 4,610,144
127 4,610,145
133 4,610,146
137 4,610,147
480 4,610,148
542 Re.32,241

**CLASS 63**

12 4,610,149

**CLASS 65**

2 4,610,707
3.12 4,610,708
4,610,709
29 4,610,710
134 4,610,711
158 4,610,712
300 4,610,713

**CLASS 66**

115 4,610,150

**CLASS 68**

205 R 4,610,151

**CLASS 70**

30 4,610,152

**CLASS 71**

28 4,610,714
4,610,715
76 4,610,716
92 4,610,717
98 Re.32,243

**CLASS 72**

88 4,610,154
112 4,610,153
353 4,610,155
431 4,610,156

**CLASS 73**

1 R 4,610,157
61.4 4,610,158
116 4,610,159
151 4,610,160
155 4,610,161
197 4,610,162
250 4,610,163
290 V 4,610,164
317 4,610,165
818 4,610,166
861.28 4,610,167
862.35 4,610,168
863.12 4,610,169
864.22 4,610,170
864.62 4,610,171

**CLASS 74**

5.46 4,610,172
10.33 4,610,173
15.2 4,610,174
15.86 4,610,175
108 4,610,176
330 4,610,177
335 4,610,178
4,610,179
501 P 4,610,180
792 4,610,181
794 4,610,184
801 4,610,182
866 4,610,183

**CLASS 75**

0.5 C 4,610,718
4,610,719
84 4,610,720
97 A 4,610,721
4,610,722
101 R 4,610,723
118 R 4,610,724
228 4,610,725
233 4,610,726

**CLASS 76**

29 4,610,185
101 R 4,610,186

**CLASS 81**

9.3 4,610,187
24 4,610,188

**CLASS 83**

30 4,610,189

**CLASS 84**

312 R 4,610,190

**CLASS 89**

34 4,610,191

**CLASS 91**

341 R 4,610,192
420 4,610,193
446 4,610,194
488 4,610,195

**CLASS 98**

2 4,610,196
110 4,610,197

**CLASS 100**

269 R 4,610,199

**CLASS 101**

126 4,610,200
217 4,610,201
223 4,610,198
364 4,610,202

**CLASS 102**

217 4,610,203
476 4,610,204
529 4,610,205

**CLASS 104**

26 B 4,610,206
256 4,610,207

**CLASS 106**

21 4,610,727

**CLASS 110**

244 4,610,208
276 4,610,209

**CLASS 112**

121.12 4,610,210
445 4,610,211

**CLASS 114**

39 4,610,212
102 4,610,213
144 E 4,610,214
249 4,610,215

**CLASS 118**

46 4,610,216
47 4,610,217
303 4,610,218

**CLASS 119**

3 4,610,219
14.47 4,610,220
72.5 4,610,221

**CLASS 123**

41.42 4,610,222
58 AM 4,610,223
90.31 4,610,224
90.55 4,610,225
143 A 4,610,226
182 4,610,227
195 R 4,610,228
4,610,229
360 4,610,230
424 4,610,231
425 4,610,232
458 4,610,233
502 4,610,234
565 4,610,235
585 4,610,236
600 4,610,237

**CLASS 126**

21 R 4,610,238
96 4,610,239
440 4,610,240

**CLASS 128**

1.3 4,610,241
4 4,610,242
20 4,610,243
77 4,610,244
82 4,610,245
201.11 4,610,246
201.28 4,610,247
325 4,610,248
328 4,610,249
334 C 4,610,250
334 R 4,610,251
346 4,610,252
382 4,610,253
419 D 4,610,254
660 4,610,255
675 4,610,256
689 4,610,257
691 4,610,258
731 4,610,259

**CLASS 131**

84.3 4,610,260

**CLASS 132**

7 4,610,261

**CLASS 134**

2 4,610,728
25.1 4,610,729

**CLASS 135**

23 4,610,262

**CLASS 136**

230 4,611,089
251 4,611,090
260 4,611,091

**CLASS 137**

85 4,610,263
119 4,610,264
219 4,610,265
315 4,610,266
329.3 4,610,267
454.6 4,610,268
489.5 4,610,269
549 4,610,270
596.13 4,610,271
625.17 4,610,272
625.32 4,610,273
828 4,610,274
854 4,610,275
856 4,610,276

**CLASS 139**

191 4,610,277

**CLASS 140**

92.1 4,610,278
105 4,610,279
4,610,280
140 4,610,281

**CLASS 141**

46 4,610,282
89 4,610,283
302 4,610,284

**CLASS 144**

231 4,610,285

**CLASS 148**

1.5 4,610,730
4,610,731
6.14 R 4,610,732
12.7 A 4,610,733
120 4,610,734
128 4,610,735
429 4,610,736

**CLASS 150**

52 J 4,610,286

**CLASS 156**

49 4,610,737
4,610,738
64 4,610,739
79 4,610,740
89 4,610,741
158 4,610,742
183 4,610,743
235 4,610,744
244.11 4,610,745
275.5 4,610,746
322 4,610,747
345 4,610,748
429 4,610,749
510 4,610,750
517 4,610,751
540 4,610,752
552 4,610,753
601 4,610,754
634 4,610,755
645 4,610,756
655 4,610,757
656 4,610,758
662 4,610,759

**CLASS 157**

1.17 4,610,287
1.22 4,610,288

**CLASS 159**

4.01 4,610,760

**CLASS 160**

35 4,610,289
84 R 4,610,290
117 4,610,291
120 4,610,292
4,610,293
331 4,610,294

**CLASS 162**

157.6 4,610,761

**CLASS 164**

5 4,610,295
469 4,610,296

**CLASS 165**

9 4,610,297
39 4,610,298
80.2 4,610,299

**CLASS 166**

134 4,610,300
245 4,610,301
246 4,610,302
251 4,610,303
261 4,610,304
275 4,610,305
293 4,610,306
321 4,610,308
382 4,610,309

**CLASS 169**

37 4,610,310
45 4,610,311

**CLASS 174**

52 PE 4,611,092
152 R 4,611,093

**CLASS 175**

4.52 4,610,312
40 4,610,313
57 4,610,314
85 4,610,315
320 4,610,307
323 4,610,316
331 4,610,317
339 4,610,318
371 4,610,319
409 4,610,320
422 R 4,610,321

**CLASS 177**

25 4,610,322
4,610,323
245 4,610,324

**CLASS 179**

7.1 TP 4,611,094
18 B 4,611,096
18 BC 4,611,095
84 A 4,611,097
84 C 4,611,098
175 4,611,099
175.3 F 4,611,100
175.3 R 4,611,101

**CLASS 180**

14.2 4,610,325
68.1 4,610,326
73.1 4,610,327
140 4,610,328

**CLASS 181**

265 4,610,329

**CLASS 182**

90 4,610,330

**CLASS 188**

18 A 4,610,331
322.15 4,610,332

**CLASS 190**

18 A 4,610,333
122 4,610,334

**CLASS 192**

3.62 4,610,335
4 A 4,610,336
4,610,337
13 A 4,610,338
48.92 4,610,339
56 R 4,610,340
58 B 4,610,341
70.28 4,610,342
105 BA 4,610,343

**CLASS 193**

5 4,610,344

**CLASS 198**

392 4,610,345
425 4,610,346
4,610,347

**CLASS 200**

5 R 4,611,102
38 B 4,611,103
43.08 4,611,104
81.9 M 4,611,105
147 R 4,611,106

**CLASS 203**

14 4,610,768

**CLASS 204**

1 R 4,610,762
35.1 4,610,763
98 4,610,764
128 4,610,765
157.52 4,610,766
157.81 4,610,767
181.7 4,610,769
192.1 4,610,770
4,610,771
206 4,610,772
285 4,610,773
298 4,610,774
4,610,775

**CLASS 206**

45.19 4,610,348
175 4,610,349
216 4,610,350
217 4,610,351
313 4,610,352
328 4,610,353
349 4,610,354
386 4,610,355
423 4,610,356
449 4,610,357
514 4,610,358

**CLASS 208**

89 4,610,778
212 4,610,779
244 4,610,780
417 4,610,777
418 4,610,776

**CLASS 209**

3.1 4,610,359
518 4,610,360
555 4,610,361

**CLASS 210**

85 4,610,781
137 4,610,782
169 4,610,783
4,610,784
195.1 4,610,785
236 4,610,786
239 4,610,787
242.3 4,610,788
321.4 4,610,789
490 4,610,791
636 4,610,790
639 4,610,792
767 4,610,793
776 4,610,794

**CLASS 211**

59.4 4,610,362
74 4,610,363
183 4,610,364

**CLASS 212**

262 4,610,365

**CLASS 215**

1 C 4,610,366
252 4,610,367

**CLASS 219**

69 W 4,611,107
121 PR 4,611,108
121 PY 4,611,109
4,611,110
124.34 4,611,111
455 4,611,112

**CLASS 220**

19 4,610,368
85 B 4,610,369
207 4,610,370
266 4,610,371
288 4,610,372

**CLASS 221**

155 4,610,373

**CLASS 222**

83 4,610,374
131 4,610,375
185 4,610,376
288 4,610,377
333 4,610,378

**CLASS 226**

42 4,610,379
142 4,610,380

**CLASS 227**

7 4,610,381
9 4,610,382
19 4,610,383
67 4,610,384
4,610,385
142 4,610,386

**CLASS 228**

1.1 4,610,387
6.2 4,610,388
176 4,610,389
207 4,610,390
219 4,610,391

**CLASS 229**

1.5 R 4,610,392

**CLASS 235**

78 R 4,611,113

**CLASS 236**

12.15 4,610,393

**CLASS 239**

57 4,610,394

**CLASS 241**

5 4,610,395
24 4,610,396
86 4,610,397
92 4,610,398
101 B 4,610,399
261.2 4,610,400
294 4,610,401

**CLASS 242**

7.22 4,610,402
7.23 4,610,403
25 R 4,610,404
35.5 A 4,610,405
4,610,406
55.2 4,610,407
78.6 4,610,408
106 4,610,409

**CLASS 244**

12.5 4,610,410
50 4,610,411

**CLASS 248**

48.2 4,610,412
220.3 4,610,413
449 4,610,414
455 4,610,415
459 4,610,416
460 4,610,417
495 4,610,418
547 4,610,419
550 4,610,420
4,610,421

**CLASS 249**

94 4,610,422

**CLASS 250**

211 R 4,611,114
216 4,611,115
239 4,611,116
252.1 4,611,117
287 4,611,118
307 4,611,119
4,611,120
423 R 4,611,121
548 4,611,122
551 4,611,123
578 4,611,124

**CLASS 251**

25 4,610,423
121 4,610,424
129.06 4,610,426
4,610,427
129.16 4,610,428
129.2 4,610,425
148 4,610,429
327 4,610,430

**CLASS 252**

8.551 4,610,795
8.75 4,610,796
35 4,610,797
49.6 Re.32,246
79.2 4,610,798
90 4,610,799
174.12 4,610,800
181 4,610,801
188.2 4,610,802
299.1 4,610,803
4,610,804
299.62 4,610,805
301.16 4,610,806
301.21 4,610,807
500 4,610,809
511 4,610,810
4,610,811
512 4,610,808
522 R 4,610,812
4,610,813

**CLASS 254**

93 HP 4,610,431

**CLASS 256**

65 4,610,432

**CLASS 260**

410.5 4,610,825
501.11 4,610,827
501.13 4,610,828
543 R 4,610,829

**CLASS 264**

9 4,610,830
40.7 4,610,831
44 4,610,832
235.8 4,610,833
249 4,610,834
250 4,610,835
313 4,610,836
339 4,610,837

**CLASS 266**

50 4,610,433
75 4,610,434
250 4,610,435
272 4,610,436
275 4,610,437

**CLASS 267**

8 R 4,610,438

**CLASS 269**

3 4,610,439
20 4,610,440
48.1 4,610,441
73 4,610,442

**CLASS 271**

12 4,610,444
160 4,610,445
291 4,610,446

**CLASS 272**

70 4,610,447
93 4,610,448
118 4,610,449

**CLASS 273**

3 A 4,610,450
33 4,610,451

**CLASS 277**

83 4,610,452

**CLASS 280**

5 A 4,610,453
33.99 A 4,610,454
91 4,610,455
165 4,610,456
204 4,610,457
242 WC Re.32,242
495 4,610,458
615 4,610,459
650 4,610,460
660 4,610,461
707 4,610,462
751 4,610,463
808 4,610,464

**CLASS 285**

3 4,610,465
12 4,610,466
24 4,610,467
81 4,610,468
260 4,610,469
321 4,610,470
337 4,610,471

**CLASS 290**

55 4,611,125

**CLASS 292**

54 4,610,472

**CLASS 294**

64.1 4,610,473
82.27 4,610,474
86.4 4,610,475
149 4,610,476

**CLASS 296**

97 H 4,610,443
97 K 4,610,477
214 4,610,478

**CLASS 297**

332 4,610,479
478 4,610,480

**CLASS 300**

21 4,610,481

**CLASS 301**

63 R 4,610,482

**CLASS 303**

97 4,610,483
100 4,610,484
114 4,610,485

**CLASS 307**

64 4,611,126
116 4,611,127
252 B 4,611,128
308 4,611,129
355 4,611,130
449 4,611,131
462 4,611,132
465 4,611,133
482 4,611,134
572 4,611,135
603 4,611,136

**CLASS 310**

54 4,611,137
71 4,611,138
266 4,611,139
313 B 4,611,140
334 4,611,141

**CLASS 312**

227 4,610,489
272 4,610,490
291 4,610,491
305 4,610,492

**CLASS 313**

30 4,611,142
111 4,611,143
373 4,611,144
446 4,611,145
4,611,146
550 4,611,147
595 4,611,148

**CLASS 315**

5.39 4,611,149
307 4,611,150
368 4,611,151
411 4,611,152

**CLASS 318**

318 4,611,153
490 4,611,154
603 4,611,155
632 4,611,156
696 4,611,157
803 4,611,158
4,611,159

**CLASS 320**

2 4,611,160
4,611,161

**CLASS 323**

269 4,611,162
367 4,611,163

**CLASS 324**

77 B 4,611,164
4,611,165
95 4,611,166
137 4,611,167
174 4,611,168
208 4,611,169
229 4,611,170
253 4,611,171
314 4,611,172
339 4,611,173
424 4,611,174
425 4,611,175

**CLASS 328**

184 4,611,176

**CLASS 329**

50 4,611,177

**CLASS 330**

272 4,611,178
293 4,611,179
298 4,611,180

**CLASS 331**

66 4,611,181
69 4,611,182
78 4,611,183

**CLASS 333**

100 4,611,184
167 4,611,185
246 4,611,186

**CLASS 335**

16 4,611,187
4,611,188
37 4,611,189

**CLASS 336**

10 4,611,190
84 R 4,611,191

**CLASS 337**

165 4,611,192

**CLASS 339**

14 R 4,610,493
75 MP 4,610,495
75 P 4,610,494
91 B 4,610,496
176 L 4,610,497
186 R 4,610,498

**CLASS 340**

52 F 4,611,193
347 AD 4,611,196
347 DA 4,611,195
347 SH 4,611,194
522 4,611,197
539 4,611,198
576 4,611,199
628 4,611,200
638 4,611,201
724 4,611,202
773 4,611,203
825.35 4,611,205
825.8 4,611,204
870.11 4,611,206
870.16 4,611,207

**CLASS 343**

5 CM 4,611,208
6.5 R 4,611,209
9 R 4,611,211
351 4,611,212
359 4,611,210
702 4,611,213
790 4,611,214

**CLASS 346**

49 4,611,215
75 4,611,216
76 PH 4,611,217
4,611,218
140 R 4,611,219

**CLASS 350**

3.7 4,610,499
3.71 4,610,500
96.10 4,610,501
96.12 4,610,502
96.20 4,610,503
4,610,504
96.23 4,610,505
96.33 4,610,506
334 4,610,510
335 4,610,507
337 4,610,508
339 F 4,610,509
402 4,610,511
429 4,610,512
442 4,610,513
455 4,610,514
474 4,610,515
475 4,610,516
580 4,610,517
630 4,610,518

**CLASS 351**

86 4,610,519

**CLASS 354**

4,610,520
145.1 4,610,521
173.1 4,610,522
195.1 4,610,523
274 4,610,524
415 4,610,525

**CLASS 355**

3 BE 4,610,526
3 DD 4,610,527
4,610,528
4 4,610,529
14 D 4,610,531
4,610,532
14 SH 4,610,533
14 TR 4,610,530
15 4,610,534
32 4,610,535
38 4,610,536
68 4,610,537
69 4,610,538
77 4,610,539

**CLASS 356**

28.5 4,610,540
237 4,610,541
240 4,610,542
350 4,610,543
410 4,610,544

**CLASS 357**

23.7 4,611,220
30 4,611,221
4,611,222
4,611,223
4,611,224
38 4,611,235
45 4,611,236
71 4,611,237
81 4,611,238

**CLASS 358**

19 4,611,239
23 4,611,240
60 4,611,241
123 4,611,242
140 4,611,225
144 4,611,226
147 4,611,227
149 4,611,228
158 4,611,229
4,611,230
160 4,611,231
4,611,232
4,611,233
213 4,611,234
225 4,611,243
227 4,611,244
235 4,611,245
256 4,611,246
280 4,611,247
342 4,611,248

**CLASS 360**

9.1 4,611,250
10.3 4,611,252
66 4,611,253
69 4,611,254
77 4,611,249
84 4,611,255
85 4,611,251
96.6 4,611,256
104 4,611,257
105 4,611,258
125 4,611,259

**CLASS 361**

233 4,611,260
399 4,611,261
421 4,611,262

**CLASS 362**

71 4,611,263
95 4,611,264
145 4,611,265
226 4,611,266

**CLASS 363**

58 4,611,267

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173 4,611,294
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4,611,281
300 4,611,280
405 4,611,286
406 4,611,282
414 4,611,283
417 4,611,284
424.1 4,611,285
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474 4,611,288
492 4,611,289
510 4,611,290
513 4,611,296
550 4,611,291
559 4,611,292
571 4,611,293
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736 4,611,305
900 4,611,297
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185 4,611,309
189 4,611,299
194 4,611,300
207 4,611,301
229 4,611,302
230 4,611,303
4,611,310

**CLASS 366**

2 4,610,545
110 4,610,546

270 4,610,547
279 4,610,548

**CLASS 367**

38 4,611,311
4,611,312
88 4,611,313

**CLASS 368**

113 4,610,549
281 4,610,550

**CLASS 369**

32 4,611,314
33 4,611,315
44 4,611,316
45 4,611,317
47 4,611,319
54 4,611,318

**CLASS 370**

13 4,611,320
60 4,611,321
4,611,322
79 4,611,323
97 4,611,324
110.3 4,611,325

**CLASS 371**

47 4,611,326

**CLASS 372**

45 4,611,328
58 4,611,327
88 4,611,329

**CLASS 373**

14 4,611,330
24 4,611,332
30 4,611,331
80 4,611,339
161 4,611,338

**CLASS 374**

117 4,610,551
160 4,610,552

**CLASS 375**

1 4,611,333
100 4,611,334
110 4,611,335
111 4,611,336

**CLASS 376**

248 4,610,838
272 4,610,839
283 4,610,840
305 4,610,841
416 4,610,842

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95 4,611,340
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36 4,611,342
103 4,611,343
108 4,611,344

**CLASS 382**

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9 4,611,346
27 4,611,347
44 4,611,348
47 4,611,349

**CLASS 383**

7 4,611,350

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18 4,610,487
45 4,610,488
99 4,611,351

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124 4,610,553
4,610,554
243 4,610,555

**CLASS 401**

18 4,610,556
75 4,610,557

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1 4,610,558
23 4,610,559
119 4,610,560
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402 4,610,565

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4 4,610,566
121 4,610,567

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19 4,610,568
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224 4,610,570
251 4,610,571
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259 4,610,573

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50 4,610,574
113 4,610,575

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21 4,610,576
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13 4,610,578
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132 4,610,581
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211 4,610,583
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233 4,610,585
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180 4,610,589
744 A 4,610,598

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11 4,610,590

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**CLASS 416**

207 4,610,600
234 4,610,601

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68 4,610,602
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413 4,610,608
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55 4,610,611
195 4,610,612
4,610,613
269 4,610,614

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101 4,610,846
102 4,610,847
106 4,610,848
111 4,610,849
131 4,610,850
310 4,610,851

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9 4,610,852
157 4,610,861
310 4,610,853
4,610,862
326 4,610,854
328 4,610,855
4,610,856
335 4,610,857
338 4,610,863
342 4,610,858
344 4,610,864
347 4,610,859
447.8 4,610,860
513 4,610,865
600 4,610,866
635 4,610,867

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1.1 4,610,868
9 4,610,869
19 4,610,870
48 4,610,871
49 4,610,872
52 4,610,873
70 4,610,874
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84 4,610,876
88 4,610,877
4,610,878
94 4,610,879
101 4,610,880
148 4,610,881
154 4,610,882
4,610,883

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8 4,610,615
99 4,610,616
143 4,610,617
383 4,610,618
388 4,610,619
434 4,610,620
577 4,610,621

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103 4,610,884
130 4,610,885
233 4,610,886
490 4,610,887
569 4,610,888
602 4,610,889
641 4,610,844
651 4,610,890

**CLASS 427**

3 4,610,891
27 4,610,892
34 Re.32,244
4,610,893
53.1 4,610,894
98 4,610,895
140 4,610,896
212 4,610,897
379 4,610,898
387 Re.32,245

**CLASS 428**

4 4,610,899
15 4,610,900
38 4,610,901
57 4,610,902
64 4,610,903
79 4,610,904
90 4,610,905
102 4,610,906
122 4,610,907
141 4,610,908
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632 4,610,935
659 4,610,936
4,610,937
694 4,610,930

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6 4,610,941
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135 4,610,944
138 4,610,945
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331 4,610,953
445 4,610,954
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538 4,610,956
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567 4,610,958
598 4,610,959

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5 4,610,622
243 4,610,623
255 4,610,624
284 4,610,625
351 4,610,626

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8 4,610,627
241 4,610,628

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72 4,610,629
79 4,610,630
228.1 4,610,631

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234 4,610,965

**CLASS 436**

2 4,610,966

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6 4,610,632
101 4,610,633

**CLASS 441**

75 4,610,634
80 4,610,635

**CLASS 445**

68 4,610,636

**CLASS 446**

237 4,610,637
241 4,610,638
327 4,610,639
329 4,610,640
397 4,610,641

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609 4,611,352

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69 4,610,642
143 4,610,643

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82 4,610,644
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108 4,610,655
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137 4,610,968
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65 4,610,973
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230 4,610,983
235 4,610,984
4,610,985
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253 4,610,988
282 4,610,989
302 4,610,990
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320 4,610,992
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401 4,610,999
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105 4,611,013
146 4,611,014

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130 4,611,018
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326 4,611,023
366 4,611,024
449 4,611,025
548 4,611,026
815 4,611,027
850 4,611,028

**CLASS 525**

61 4,611,029
99 4,611,030
310 4,611,031
360 4,611,032
419 4,611,033
420 4,611,034
474 4,611,035
481 4,611,036

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135 4,611,037
169.2 4,611,038
271 4,611,039
279 4,611,040
298 4,611,041

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56 4,611,044
76 4,611,045
98 4,611,046
114 4,611,047
185 4,611,048
279 4,611,049
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295.3 4,611,051
312 4,611,052
335 4,611,053

**CLASS 529**

99 4,611,016

**CLASS 530**

311 4,611,054
380 4,610,814
4,610,815

**CLASS 536**

119 4,611,055

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200 4,610,820
4,610,821
316 4,610,822
350 4,610,823
355 4,610,824
488 4,610,819

**CLASS 544**

31 4,611,056
301 4,611,057

**CLASS 546**

242 4,611,058
274 4,611,059

**CLASS 548**

171 4,611,060
260 4,611,061
309 4,611,062
406 4,611,063
484 4,611,064

**CLASS 549**

214 4,611,065
267 4,611,066
292 4,611,067
4,611,068
326 4,611,069
344 4,611,070
452 4,610,816

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70 4,611,071
135 4,611,072
442 4,611,073

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44 4,610,826
51 4,611,074
351 4,611,075
4,611,076
4,611,077
410 4,611,078

**CLASS 560**

25 4,611,079
51 4,611,080
53 4,611,081
81 4,611,087
204 4,611,082
351 4,611,083

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466 4,611,088

**CLASS 568**

630 4,611,084
885 4,611,085
897 4,611,086

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4 4,610,656
8 4,610,657
9 4,610,658
11 4,610,659
29 4,610,670
49 4,610,660
52 4,610,661
53 4,610,662
99 4,610,663
119 4,610,664
167 4,610,665
168 4,610,671
191 4,610,666
192 4,610,667
208 4,610,668
218 4,610,669
220 4,610,672
270 4,610,673
282 4,610,674
329 4,610,675
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366 4,610,685
368 4,610,678
369 4,610,679
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396 4,610,681
405 4,610,683
416 4,610,684
890 4,610,686
891 4,610,687

**CLASS 623**

1 4,610,688
6 4,610,689
8 4,610,690
9 4,610,691
16 4,610,692
4,610,693

| | | | | | | | | | | | | | | | | | |
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| D2— | 314 | 285,500 | | 321 | 285,520 | | 74 | 285,540 | | 94 | 285,560 | | 51 | 285,580 | | | 285,600 |
| | 405 | 285,501 | | | 285,521 | | 91 | 285,541 | | 100 | 285,561 | | | 285,581 | | 69 | 285,601 |
| | 422 | 285,502 | | 334 | 285,522 | | 106 | 285,542 | | | 285,562 | | 87 | 285,582 | | 74 | 285,602 |
| D3— | 35 | 285,503 | | 367 | 285,523 | D11— | 4 | 285,543 | | 103 | 285,563 | | 108 | 285,583 | | 150 | 285,603 |
| D6— | 300 | 285,504 | | 372 | 285,524 | | 34 | 285,544 | | 106 | 285,564 | | | 285,584 | D24— | 26 | 285,604 |
| | | 285,505 | D8— | 10 | 285,525 | | 160 | 285,545 | | 111 | 285,565 | | | 285,585 | | 28 | 285,605 |
| | 404 | 285,506 | | 51 | 285,526 | D12— | 155 | 285,546 | | | 285,566 | | | 285,586 | | 34 | 285,606 |
| | 419 | 285,507 | | 105 | 285,527 | | 187 | 285,547 | | | 285,567 | | | 285,587 | | 39 | 285,607 |
| | 429 | 285,508 | | 330 | 285,528 | | | 285,548 | | | 285,568 | | 130 | 285,588 | | 40 | 285,608 |
| | 525 | 285,509 | | 372 | 285,529 | | | 285,549 | | 114 | 285,569 | | 150 | 285,589 | D25— | 60 | 285,609 |
| | 556 | 285,510 | D9— | 350 | 285,530 | D13— | 24 | 285,550 | D15— | 5 | 285,570 | | | 285,599 | | 74 | 285,610 |
| | 573 | 285,511 | | 352 | 285,531 | | | 285,551 | | 69 | 285,571 | | 166 | 285,590 | | | 285,611 |
| | 601 | 285,512 | | | 285,532 | | 30 | 285,552 | D17— | 22 | 285,572 | | 205 | 285,591 | | | 285,612 |
| D7— | 1 | 285,513 | | | 285,533 | D14— | 52 | 285,553 | D18— | 4 | 285,573 | | 248 | 285,592 | | | 285,613 |
| | | 285,514 | | 365 | 285,534 | | | 285,554 | | 7 | 285,574 | | 249 | 285,593 | D26— | 11 | 285,614 |
| | 6 | 285,515 | | 367 | 285,535 | | 53 | 285,555 | | | 285,575 | | 250 | 285,594 | D27— | 47 | 285,615 |
| | 9 | 285,516 | | 398 | 285,536 | | | 285,556 | | 22 | 285,576 | D22— | 136 | 285,595 | D28— | 64 | 285,616 |
| | 74 | 285,517 | | 400 | 285,537 | | 56 | 285,557 | D20— | 4 | 285,577 | D23— | 17 | 285,596 | | 83 | 285,617 |
| | 105 | 285,518 | | 408 | 285,538 | | 59 | 285,558 | | 42 | 285,578 | | 25 | 285,597 | D32— | 4 | 285,618 |
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## PATENTS

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| 01 : | 4,611,074 | 4,610,637 | 4,610,609 | 17 : | 4,611,020 | 4,610,310 | 4,611,308 |
| | 4,611,116 | 4,610,671 | 4,610,633 | | 4,610,061 | 4,610,397 | 25 : 4,610,140 |
| | 4,611,142 | 4,610,686 | 4,610,739 | | 4,610,082 | 4,610,468 | 4,610,145 |
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| | 4,611,333 | 4,610,897 | 4,610,640 | | 4,610,429 | 4,611,180 | 4,610,744 |
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| | 4,610,354 | 4,611,277 | 4,610,100 | | 4,611,065 | 4,610,779 | 4,610,180 |
| | 4,610,388 | 4,611,284 | 4,610,212 | | 4,611,084 | 4,610,882 | 4,610,244 |
| | 4,610,416 | 4,611,289 | 4,610,463 | | 4,611,097 | 4,610,883 | 4,610,246 |
| | 4,610,425 | 4,611,293 | 4,610,51* | | 4,611,104 | 4,611,071 | 4,610,284 |
| | 4,610,451 | 4,611,297 | 4,610,890 | | 4,611,137 | 4,611,075 | 4,610,324 |
| | 4,610,452 | 4,611,309 | 4,611,124 | | 4,611,139 | 23 : 4,610,571 | 4,610,332 |
| | 4,610,461 | 4,611,310 | 4,611,126 | | 4,611,175 | 24 : 4,610,086 | 4,610,389 |
| | 4,610,465 | 4,611,311 | 4,611,201 | | 4,611,198 | 4,610,119 | 4,610,409 |
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| | 4,610,496 | 4,611,318 | 4,611,342 | | 4,611,230 | 4,610,494 | 4,610,458 |
| | 4,610,499 | 4,611,327 | 13 : 4,610,071 | | 4,611,241 | 4,610,800 | 4,610,466 |
| | 4,610,566 | 4,611,341 | 4,610,093 | | 4,611,242 | 4,610,909 | 4,610,470 |
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| | 4,610,603 | 08 : 4,610,084 | 4,610,361 | | 4,611,334 | 4,611,208 | 4,610,482 |
| | 4,610,605 | 4,610,160 | 4,610,575 | 18 : | 4,610,112 | 4,611,210 | 4,610,592 |
| | 4,610,630 | 4,610,567 | 4,610,928 | | 4,610,118 | 4,611,306 | 4,610,680 |

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## DESIGN PATENTS

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